



ಭಾರತ್ ಹೆವಿ ಎಲೆಕ್ಟ್ರಿಕಲ್ಸ್ ಲಿಮಿಟೆಡ್
भारत हेवी इलेक्ट्रिकल्स लिमिटेड

Bharat Heavy Electricals Ltd.,
(A Government of India undertaking)
Electronics Division

PB 2606 , Mysore Road Bangalore , 560026 INDIA

CE: PR: 001- Rev 01

INSTRUCTIONS TO BIDDERS (Common for all RFQs)

Bidder is requested to read the instructions carefully and submit their quotation covering all the points:

A. GENERAL INSTRUCTIONS:

1. Any Purchase Order resulting from this enquiry shall be governed by the Instructions to Bidders (document reference: CE: PR: 001 – Rev 01), General Conditions of Contract (document reference: CE: PR: 002 - Rev 01) and Special Conditions of Contract, if any, of the enquiry.
2. Any deviations from or additions to the “General Conditions of Contract” or “Special Conditions of Contract” require BHEL’s express written consent. The general terms of business or sale of the bidder shall not apply to this tender.
3. Bidders (also includes the term suppliers / contractors wherever used in this document) are instructed to quote their most competitive price and best delivery, etc. in the offer. Prices should be indicated in both figures & words. **(Please also refer clause 11 under section B)**
4. Regret letter (either through post or by mail) indicating reasons for not quoting must be submitted without fail, in case of non-participation in this tender. If a bidder fails to respond against 3 consecutive tenders for the same item, he will be liable for removal as a registered vendor of BHEL.
5. Procurement directly from the manufacturers shall be preferred. However, if the OEM / Principal insist on engaging the services of an agent, such agent shall not be allowed to represent more than one manufacturer / supplier in the same tender. Moreover, either the agent could bid on behalf of the manufacturer / supplier or the manufacturer / supplier could bid directly but not both. In case bids are received from the manufacturer / supplier and his agent, bid received from the agent shall be ignored.
6. Consultant / firm (and any of its affiliates) shall not be eligible to participate in the tender/s for the related goods for the same project if they were engaged for consultancy services for the same project.
7. If an Indian representative / associate / liaison office quotes on behalf of a foreign based bidder, such representative shall furnish compulsorily the following documents:
 - a. Authorization letter to quote and negotiate on behalf of such foreign-based bidder.
 - b. Undertaking from such foreign based bidder that such contract will be honored and executed according to agreed scope of supply and commercial terms and conditions.
 - c. Undertaking shall be furnished by the Indian representative stating that the co-ordination and smooth execution of the contract and settlement of shortages / damages / replacement / repair of imported scope till system is commissioned and handed over to customer will be the sole responsibility of the Indian representative / associates / agent / liaison office.
 - d. Refer **Annexure X** on “Guidelines for Indian Agents”.
8. In case of imported scope of supply, customs clearance & customs duty payment will be to BHEL account after the consignment is received at Indian Airport / Seaport. Bidders must provide all original documents required for completing the customs clearance along with the shipment. Warehousing charges due to

incomplete or missing documentation will be recovered from the supplier's bill. All offers for imported scope of supply must be made from any of the gateway ports (within the country) indicated. **(Refer Annexure I)**

9. The offers of the bidders who are on the banned list and also the offers of the bidders, who engage the services of the banned firms, shall be rejected. The list of the banned firms is available on BHEL website: **www.bhel.com**
10. Business dealings with bidders will be suspended if they are found to have indulged in any malpractices / misconduct which are contrary to business ethics like bribery, corruption, fraud, pilferage, cartel formation, submission of fake/false/forged documents, certificates, information to BHEL or if they tamper with tendering procedure affecting the ordering process or fail to execute a contract, or rejection of 3 consecutive supplies or if their firms / works are under strike / lockout for a long period.

B. GUIDELINES FOR PREPARATION OF OFFER:

1. Quotation shall be submitted in Single Part Bid, Two Part Bid or Three Part Bid, as called for in the tender:
 - **SINGLE PART BID:** Technical and Commercial Bid with prices along with price summary & filled in BHEL Standard Commercial terms and conditions in a single sealed envelope.
 - **TWO PART BID:** Unpriced offer i.e. "Techno-commercial Bid" with filled in BHEL Standard Commercial terms and conditions in a sealed envelope **along with the copy of the "Price Bid" without the prices** should be enclosed in one cover and the cover must be super scribed "**Techno-commercial offer**) and Priced offer i.e. "Price Bid" containing price summary in a separate sealed envelope and must be super scribed "**Price Bid**". Both these envelopes shall be enclosed in a single sealed envelope super scribed with enquiry number due date of tender and any other details as called for in the tender document.
 - **THREE PART BID:** Pre-qualification Bid (Part-I), Techno Commercial Bid with filled in BHEL Standard Commercial terms and conditions (Part-II), and Price Bid (Part-III). All three envelopes shall be enclosed in a single sealed envelope super scribed with enquiry number due date of tender and any other details as called for in the tender document.

If any of the offers (Part I, Part II or Part III) are not submitted before the due date and time of submission or if any part of the offer is incomplete the entire offer of the bidder is liable for rejection.

2. Supplier shall ensure to super scribe each envelope with RFQ number, RFQ Date, RFQ Due date and time, Item Description and Project clearly & boldly. Also mention on the envelope whether it is "Techno Commercial Bid" or "Price Bid" or "Pre-Qualification Bid". Please ensure complete address, department name and purchase executive name is mentioned on the envelope (before dropping in the tender box or handing over) so that the tender is available in time for bid opening.
3. BHEL standard Commercial Terms and Conditions (duly filled, signed & stamped) must accompany Technical-Commercial offer without fail and should be submitted in original only. Xerox copy will not be accepted.
4. Any of the terms and conditions not acceptable to supplier, shall be explicitly mentioned in the Techno-Commercial Bid. If no deviations are brought out in the offer it will be treated as if all terms and conditions of this enquiry are accepted by the supplier without deviation.
5. Deviation to this specification / item description, if any, shall be brought out clearly indicating "DEVIATION TO BHEL SPECIFICATION" without fail, as a part of Techno-Commercial Bid. If no deviations are brought out in the offer it will be treated as if the entire specification of this enquiry is accepted without deviation.
6. Suppliers shall submit one set of original catalogue, datasheets, bill of materials, dimensional drawings, mounting details and / or any other relevant documents called in purchase specification as part of Technical Bid.
7. "Price Bid" shall be complete in all respects containing price break-up of all components along with all

applicable taxes and duties, packing & forwarding charges (if applicable), freight charges (if applicable) etc. Once submitted no modification / addition / deletion will be allowed in the "Price Bid." Bidders are advised to thoroughly check the unit price, total price to avoid any discrepancy.

8. In addition, bidder shall also quote for erection & commissioning charges (E&C charges), documentation charges, service charges, testing Charges (type & routine), training charges, service tax, etc. wherever applicable. The price summary must indicate all the elements clearly.
9. Vendors should indicate "lump sum" charges (including To & Fro Fare, Boarding, Lodging, Local Conveyance etc.) for Supervision of Erection, Commissioning and handing over to customer. The quotation shall clearly indicate scope of work, likely duration of commissioning, pre-commissioning checklist and service tax (if any).
10. Wherever bidders require PAC (Project Authority Certificate) for import of raw materials, components required for Mega Power Projects, Export Projects or other similar projects wherein supplies are eligible for customs duty benefits, lists and quantities of such items and their values (CIF) has to be mentioned in the offer. Prices must be quoted taking into account of such benefits.
11. All quotations shall be free from corrections /overwriting. Corrections if any should be authenticated with signature and seal. Any typographical error, totaling mistakes, currency mistake, multiplication mistake, summing mistakes etc. observed in the price bids will be evaluated as per **Annexure II** "Guidelines for dealing with Discrepancy in Words & Figures – quoted in price bid". BHEL decision will be final.

C. GUIDELINES FOR OFFER SUBMISSION:

1. Offers / Quotations must be dropped in tender box before 13.00 Hrs. on or before due date mentioned in RFQ. The offers are to be dropped in the proper slot of the Tender Box kept in our reception area with caption "CE, SC&PV, DEFENCE." Tenders are opened on 3 days in a week (Monday/Wednesday/Friday). Tender must be deposited in the slot corresponding to the day (Monday - Box no.4/Wednesday - Box no. 6 /Friday - Box no.8) while depositing the offer. **(This clause will not be applicable for e-tenders)**
2. E-Mail / Internet / EDI offers received in time shall be considered only when such offers are complete in all respects. In case of offers received through E-mail, please send the offer to the email ID specified in the SCC of the tender. (Refer to SCC document of tender)
3. In cases where tender documents are bulky, or due to some reasons tender documents are required to be submitted by hand or through posts/couriers, the offers are to be handed over either of the two officers whose names are mentioned in the RFQ. (Refer to SCC document of tender)
4. Tenders will be opened on due date, time and venue as indicated in the RFQ in the presence of bidders at the venue indicated in the RFQ. In case of e-procurement, bidders can see tender results till seven days after due date and time.
5. Vendor will be solely responsible:
 - a. For submission of offers before due date and time. Offers submitted after due date and time will be treated as "Late offers" and will be rejected.
 - b. For submission of offers in the correct compartment of the tender box based on the day of due date (Monday/Wednesday/Friday). Please check before dropping your offer in the correct tender box.
 - c. For depositing offers in proper sealed condition in the tender box. If the bidder drops the tender in the wrong tender box or if the tender document is handed over to the wrong person BHEL will not be responsible for any such delays.
 - d. For offers received through email etc., suppliers are fully responsible for lack of secrecy on information and ensuring timely receipt of such offers in the tender box before due date & time.
 - e. In case of e-tender, all required documents should be uploaded before due date and time. Availability of power, internet connections, etc. will be the sole responsibility of the vendor. Wherever assistance is

needed for submission of e-tenders, help line numbers and executives of service provider of BHEL may be contacted.

Service provider: M-junction

Website address: <https://bheleps.buyjunction.in/>

Helpline no.: 033-66106426/6217/6013/6046/6176 (9:30 am to 5:30 pm)

9163348283/9163348284/9163348285/9163348286/8584008116 (5:30 pm to 8:30 pm)

Purchase Executive / BHEL will not be responsible for any of the activities relating to submission of offer.

D. PROCESSING OFFERS RECEIVED:

1. Any discount / revised offer submitted by the supplier on its own shall be accepted provided it is received on or before the due date and time of offer submission (i.e. Part-I bid). The discount shall be applied on pro-rata basis to all items unless specified otherwise by the bidder.
2. Changes in offers or Revised offers given after Part-I bid opening shall not be considered as a part of the original offer unless such changes / revisions are requested by BHEL.
3. In case there is no change in the technical scope and / or specifications and / or commercial terms & conditions, the supplier will not be allowed to change any of their bids after Technical bids are opened (after the due date and time of tender opening).
4. In case of changes in scope and/ or technical specifications and/ or commercial terms & conditions by BHEL and it accounts for price implications from vendors, all techno-commercially acceptable bidders shall be asked by BHEL (after freezing the scope, technical specifications and commercial terms & conditions) to submit the impact of such changes on their price bid. Impact price will be applicable only for changes in technical specification / commercial conditions by BHEL. The impact price must be submitted on or before the cut-off date specified by BHEL and the original price bid and the price impact bid will be opened together at the time of price bid opening.
5. a) BHEL EDN reserves the right to go for Reverse Auction (RA) (Guidelines as available on www.bhel.com) instead of opening the sealed envelope price bid, submitted by the bidder. This will be decided after techno-commercial evaluation. Bidders to give their acceptance with the offer for participation in RA. Non-acceptance to participate in RA may result in non-consideration of their bids, in case BHEL decides to go for RA.
 b) Those bidders who have given their acceptance to participate in Reverse Auction will have to necessarily submit 'Process compliance form' (to the designated service provider) as well as 'Online sealed bid' in the Reverse Auction. Non-submission of 'Process compliance form' or 'Online sealed bid' by the agreed bidder(s) will be considered as tampering of the tender process and will invite action by BHEL as per extend guidelines for suspension of business dealings with suppliers/contractors (as available on www.bhel.com).
 c) The bidders have to necessarily submit online sealed bid less than or equal to their envelope sealed price bid already submitted to BHEL along with the offer. ***The envelope sealed price bid of successful L1 bidder in RA, if conducted, shall also be opened after RA and the order will be placed on lower of the two bids (RA closing price & envelope sealed price) thus obtained. The bidder having submitted this offer specifically agrees to this condition and undertakes to execute the contract on thus awarded rates.***

d) If it is found that L1 bidder has quoted higher in online sealed bid in comparison to envelope sealed bid for any item(s), the bidder will be issued a warning letter to this effect. However, if the same bidder again defaults on this count in any subsequent tender in the unit, it will be considered as fraud and will invite action by BHEL as per extant guideline for suspension of business dealing with suppliers/contractors (as available on www.bhel.com).

6. Un-opened bids (including price bids) will be returned to the respective bidders after release of PO and receipt of order acknowledgement from the successful bidder.
7. After receipt of Purchase Order, supplier should submit required documents like drawings, bill of materials, datasheets, catalogues, quality plan, test procedure, type test report , O & M Manuals and / or any other relevant documents as per Specification / Purchase Order, as and when required by BHEL / Customer.
8. Any deviation to the terms and conditions not mentioned in the quotation by supplier in response to this enquiry will not be considered, if put forth subsequently or after issue of Purchase Order, unless clarification is sought for by BHEL EDN and agreed upon in the Purchase Order.
9. Evaluation shall be on the basis of delivered cost (i.e. "Total Cost to BHEL").
 "Total Cost to BHEL" shall include total basic cost, packing & forwarding charges, taxes and duties, freight charges, insurance, service tax for services, any other cost indicated by vendor for execution of the contract and loading factors (for non-compliance to BHEL Standard Commercial Terms & Conditions). Benefits arising out of Nil Import Duty on Mega Projects, Physical Imports or such 100% exemptions (statutory benefits), customer reimbursements of statutory duties (like Excise Duty, CST, VAT) will also be taken into account at the time of tender evaluation. (wherever applicable and as indicated in SCC document of tender)
10. For evaluation of offers in foreign currency, the exchange rate (TT selling rate of SBI) shall be taken as under:

Single part bids:	Date of tender opening
Two/three part bids:	Date of Part-I bid opening
Reverse Auction:	Date of Part-I bid opening

In case of Performance Bank Guarantee (PBG) also, exchange rate will be considered as mentioned above for converting foreign currency to Indian currency and vice versa.

If the relevant day happens to be a bank holiday, then the exchange rate as on the previous working day of the bank (SBI) shall be taken.
11. Ranking (L-1, L-2 etc.) shall be done only for the techno-commercially acceptable offers.

E. INFORMATION ON PAYMENT TERMS:

1. All payments will be through Electronic Fund transfer (EFT). Vendor has to furnish necessary details as per BHEL standard format (**Refer Annexure IV**) for receiving all payments through NEFT. (Applicable for Indian vendors only)
2. In case of High Sea Sales transaction, customs clearance of the consignment landed on Indian Sea / Air ports will be done by BHEL based on the original HSS documents provided by vendors. All warehousing charges due to delay in submission of complete and or correct HSS documents to BHEL will be to suppliers account only. Such recovery will be made out of any of the available bills. (**Refer Annexure V**).
3. Statutory deductions, if any, will be made and the deduction certificate shall be issued. In case vendor does not provide PAN details, the TDS deduction shall be at the maximum percentage stipulated as per the provisions of Income Tax Act. (Applicable for Indian vendors only).
 Foreign vendors shall submit relevant details of their bankers like Swift Code, Banker's Name & Address etc.

4. Vendors must submit bills & invoices along with required supporting documents in time. Incomplete documentation / delayed submission of invoice / documents will result in corresponding delay in payment.

F. STANDARD PAYMENT TERMS OF BHEL-EDN

Purchase Orders for indigenous procurement

(a) SUPPLY WITH E&C:

- 1) 85% of basic value (excluding E&C charges) + 100% of taxes, duties and freight charges will be paid in 45 days from the date of dispatch or 15 days from the date of submission of complete set of documentation whichever is later.
- 2) 15% of basic value (retention money), (excluding E&C charges) will be paid in 15 days from the date of submission of documents against supplementary invoice with proof of completion of E&C along with E & C charges (if any)

(b) SUPPLY WITH SUPERVISION OF E&C:

- 1) 90% basic value (excluding E&C charges) + 100% of taxes, duties and freight charges will be paid in 45 days from the date of dispatch or 15 days from the date of submission of complete set of documentation whichever is later.
- 2) 10% of basic value (retention money), (excluding E&C charges) will be paid in 15 days from the date of completion of erection and commissioning against supplementary invoice with proof of completion of E&C along with supervision charges (if any)

(c) SUPPLY ONLY:

- 1) 100% of PO value with taxes, duties and freight will be paid in 45 days from the date of dispatch or 15 days from the date of submission of complete set of documentation whichever is later.

Purchase orders for import procurement:

(d) SUPPLY WITH E&C:

- 1) 85% of the basic value (excluding E&C charges) will be paid in 45 days, against usance draft of 45 days, from the date of AWB/BOL on submission of complete set of documents.
- 2) 15% of basic value (retention money), (excluding E&C charges) will be paid in 15 days from the date of completion of E&C along with E & C charges against supplementary invoice with proof of completion of E&C (if any).

(e) SUPPLY WITH SUPERVISION OF E&C:

- 1) 90% of the value of the order will be paid on the 45th day, against usance draft of 45 days, from the date of AWB/BOL on submission of complete set of documents.
- 2) 10% of basic value (retention money) will be paid in 15 days from the date of completion of erection and commissioning against supplementary invoice with proof of completion of E&C along with supervision charges (if any).

(f) SUPPLY ONLY:

- 1) 100% of PO value will be paid against usance draft of 45 days from the date of dispatch or 15 days from the date of submission of complete set of documents whichever is later.

LOADING FACTORS FOR PAYMENT TERMS:

- 1) For offers received with requests for negotiation of documents through bank loading will be 15% of basic value (all bank charges to be borne by the seller).
(This loading factor is applicable only for purchase orders for indigenous supply).
- 2) In all cases where credit period is 30 days but not in line with the above mentioned standard payment terms offered loading applicable will be 5% of basic value.
(This loading factor is applicable only for purchase orders for indigenous supply).
- 3) For offers received with Letter of Credit payment term in place of sight draft payment term, loading applicable will be 5% of basic value. Additional loading of 5% will be applicable for payment terms as Letter of Credit with usance of less than 45 days.
(This loading factor is applicable only for purchase orders for imported supply).
- 4) For offers received with Sight Draft payment terms with usance of less than 45 days, loading of 5% will be applicable.
(This loading factor is applicable only for purchase orders for imported supply).
- 5) All payment terms with credit period of less than 30 days for indigenous supply and any other variation of payment terms are liable for rejection.
- 6) Standard payment terms indicated in para F (a), (b), (c), (d), (e) and (f) will not attract any loading.

Note 1: Basic value of Purchase Order mentioned above will include all components of the purchase order and will exclude only taxes, duties, freight and E&C charges (wherever applicable).

Wherever the Purchase Order is split into import portion and indigenous portion of supply the retention money will be 15% or 10% (as applicable) of both purchase order values put together.

Note 2: *If the E&C could not be completed till the end of the Warranty period due to reasons not attributable to the supplier, BHEL may consider releasing the retention money to the supplier against Bank Guarantee for equivalent value valid for an initial period of one year.*

G. Bank guarantee (BG) / Performance bank guarantee (PBG):

1. Bank guarantee (BG) / Performance bank guarantee (PBG) will be applicable as called in the tender documents. Such PBG shall be valid for a period of 36 months + claim period of 6 months for a value equal to 10 % of the basic value of the purchase order. No deviation for the duration of PBG / BG will be permitted.
 - a. PBG shall be from any of the BHEL consortium of bankers **(refer Annexure VI)**.
 - b. PBGs from nationalized banks are also acceptable.
 - c. PBG should be sent directly by the bank to the dealing executive mentioned in the purchase order located at the address mentioned in the purchase order. PBG should be in the format indicated. **(Refer annexures VII & VIII respectively)**. No deviation to these formats will be allowed.
 - d. Confirmation from any of the BHEL consortium of banks or any of the Indian Public Sector Banks is essential for the acceptance of PBGs issued by foreign banks (located outside India).

- e. Expired BGs / PBGs will be returned only after expiry of the claim period or on completion of the contractual obligation.
- f. **Non acceptance for submission of PBG will attract loading as indicated below**
 - i. Loading will be equal to the percentage of value for which BG / PBG is not provided. (Ex: if PBG / BG is given for 3 % of the basic value against 10% specified, loading applicable will be 7% ($10 - 3 = 7$ %). This value will be added to the quoted price while evaluating the lowest offer.

H. PROVISIONS APPLICABLE FOR MSE VENDORS (MICRO AND SMALL ENTERPRISES)

Vendors who qualify as MSE vendors are requested to submit applicable certificates (as specified by the Ministry of Micro, Small and Medium Enterprises) at the time of vendor registration. Vendors have to submit any of the following documents along with the tender documents in the Part I / Technical bid cover to avail the applicable benefits.

- a. Valid NSIC certificate or
- b. Entrepreneur's Memorandum part II (EM II) certificate (deemed valid for 2 years).
- c. EM II certificate with CA certificate **(in the prescribed format given in Annexure IX)** applicable for the year certifying that the investment in plant and machinery of the vendor is within permissible limits as per the MSME Act 2006 for relevant status where the deemed validity is over.
- d. Documents submitted for establishing the credentials of MSE vendors must be valid as on the date of part I / technical bid opening for the vendors to be eligible for the benefits applicable for MSE vendors. Documents submitted after the Part I / Technical bid opening date will not be considered for this tender.

PURCHASE PREFERENCE FOR MSE VENDORS:

- e. MSE vendors quoting within a price band of L1 + 15% shall be allowed to supply up to 20% of the requirement against this tender provided
 - 1. The MSE vendor matches the L1 price
 - 2. L1 price is from a non MSE vendor
 - 3. L1 price will be offered to the nearest vendor nearest to L1 in terms of price ranking (L2 - nearest to L1). In case of non-acceptance by the MSE vendor (L2) next ranking MSE vendor will be offered who is within the L1 + 15% band (if L3 is also within 15% band).
 - 4. 20% of the 20% (i.e. 4% of the total enquired quantity) will be earmarked for SC/ST owned MSE firms provided conditions as mentioned in (1) and (2) are fulfilled.
 - 5. In case no vendor under SC / ST category firms are meeting the conditions mentioned in (1) and (2) or have not participated in the tender, in such cases the 4% quantity will be distributed among the other eligible MSE vendors who have participated in the tender.
 - 6. Serial no. 1 to 5 will not be applicable wherever it is not possible to split the tendered quantity / items on account of customer contract requirement, or the items tendered are systems. Such information that tendered quantity will not be split will be indicated in the SCC.

I. INTEGRITY COMMITMENT IN THE TENDER PROCESS, AND EXECUTION OF CONTRACTS:**1. Commitment by BHEL:**

BHEL commits to take all measures necessary to prevent corruption in connection with the Tender process and execution of the Contract. BHEL will, during the tender process, treat all bidder / suppliers in a transparent and fair manner, and with equity.

2. Commitment by Bidder(s)/ Contractor(s):

- a. The Bidder(s)/ Contractor(s) commit(s) to take all measures to prevent corruption and will not directly or indirectly try to influence any decision or benefit which he is not legally entitled to.
- b. The Bidder(s)/ Contractor(s) will not enter with other Bidder(s) into any undisclosed agreement or understanding or any actions to restrict competition.
- c. The Bidder(s)/ Contractor(s) will not commit any offence under the relevant Acts. The Bidder(s)/ Contractor(s) will not use improperly, for purposes of competition or personal gain or pass on to others, any information or document provided by BHEL as part of business relationship.
- d. The Bidder(s)/ Contractor(s) will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract and shall adhere to the relevant guidelines issued from time to time by Government of India/ BHEL.

If the Bidder(s) / Contractor(s), before award or during execution of the Contract commit(s) a transgression of the above or in any other manner such as to put his reliability or credibility in question, BHEL is entitled to disqualify the Bidder(s) / Contractor (s) from the tender process or terminate the contract and/ or take suitable action as deemed fit.

PURCHASE EXECUTIVE



ಭಾರತ್ ಹೆವಿ ಎಲೆಕ್ಟ್ರಿಕಲ್ಸ್ ಲಿಮಿಟೆಡ್
भारत हेवी इलेक्ट्रिकल्स लिमिटेड

Bharat Heavy Electricals Ltd.,
(A Government of India undertaking)
Electronics Division

PB 2606 , Mysore Road Bangalore , 560026 INDIA

CE: PR: 002- Rev 01

GENERAL COMMERCIAL CONDITIONS FOR CONTRACT

These 'General Commercial Conditions for Contract for Purchase' hereinafter referred to as GCC apply to all enquiries, tenders, requests for quotations, orders, contracts and agreements concerning the supply of goods and the rendering of related services (hereinafter referred to as "deliveries") to Bharat Heavy Electricals Limited and any of its units, regions or divisions (hereinafter referred to as "BHEL" or the Purchaser) or its projects / customers.

Any deviations from or additions to these GCC require BHEL's express written consent. The general terms of business or sale of the vendor shall not apply to BHEL. Acceptance, receipt of shipments or services or effecting payment shall not mean that the general terms of business or sale of the vendor have been accepted.

Orders, agreements and amendments thereto shall be binding if made or confirmed by BHEL in writing. Only the Purchasing department of BHEL is authorized to issue the Purchase Order or any amendment thereof.

Definitions: Throughout these conditions and in the specifications, the following terms shall have the meanings assigned to them, unless the subject matter or the context requires otherwise.

- a) 'The Purchaser' means Bharat Heavy Electricals Limited, Electronics division, Mysore road, Bangalore 560 026, a Unit of Bharat Heavy Electricals Limited (A Govt. of India Undertaking) incorporated under the Companies Act having its registered office at BHEL House, Siri Fort, New Delhi-110049, India and shall be deemed to include its successors and assigns. It may also be referred to as BHEL.
- b) 'The vendor' means the person, firm, company or organization on whom the Purchase Order is placed and shall be deemed to include the vendor's successors, representative heirs, executors and administrator as the case may be. It may also be referred to as Seller, Contractor or Supplier.
- c) 'Contract' shall mean and include the Purchase Order incorporating various agreements, viz. tender/ RFQ, offer, letter of intent / acceptance / award, the General Conditions of Contract and Special Conditions of Contract for Purchase, Specifications, Inspection / Quality Plan, Schedule of Prices and Quantities, Drawings, if any enclosed or to be provided by BHEL or his authorized nominee and the samples or patterns if any to be provided under the provisions of the contract.
- d) 'Parties to the Contract' shall mean the 'The Vendor' and the Purchaser as named in the main body of the Purchase Order.

Interpretation:

In the contract, except where the context requires otherwise:

- a) words indicating one gender include all genders;
- b) words indicating the singular also include the plural and words indicating the plural also include the singular;
- c) provisions including the word "agree", "agreed" or "agreement" require the agreement to be recorded in writing, and
- d) "Written" or "in writing" means hand-written, type-written, printed or electronically made, and resulting in a permanent record.

Applicable Conditions:

1. **Price Basis:** All prices shall be firm until the purchase order is executed / completed in all respects. No price variations / escalation shall be permitted unless otherwise such variations / escalations are provided for and agreed by BHEL in writing in the purchase order.
2. **Validity:** The offer will be valid for a period of 120 days from the date of technical bid opening date. Validity beyond 120 days, if required, will be specified in the SCC (special conditions of contract).
3. **Ordering and confirmation of Order:** Vendor shall send the order acceptance on their company letter head within two weeks from the date of Purchase Order or such other period as specified / agreed by BHEL. BHEL reserves the right to revoke the order placed if the order confirmation differs from the original order placed. The acceptance of goods/services/supplies by BHEL as well as payments made in this regard shall not imply acceptance of any deviations.
The purchase order will be deemed to have been accepted if no communication to the contrary is received within two weeks (or the time limit as specified / agreed by BHEL) from the date of the purchase order.
4. **Documentation:** After receipt of Purchase Order, vendor should submit required documents like drawings, bill of materials, datasheets, catalogues, quality plan, test procedure, type test report , O & M Manuals and/or any other relevant documents as per Specification/Purchase Order, as and when required by BHEL/Customer.
At any stage within the contract period, the vendor shall notify of any error, fault or other defect found in BHEL's documents /specifications or any other items for reference. If and to the extent that (taking account of cost and time) any vendor exercising due care would have discovered the error, fault or other defect when examining the documents/specifications before submitting the tender, the time for completion shall not be extended. However if errors, omissions, ambiguities, inconsistencies, inadequacies or other defects are found in the vendor's documents, they shall be corrected at his cost, notwithstanding any consent or approval.
5. **Penalty:**
For delay in documentation: In the event of delay in submission of complete set of documents ((like drawings, bill of materials, datasheets, catalogues, quality plan etc. as called in tender specifications including soft copies wherever applicable) in required sets beyond three weeks (or as agreed/indicated in the Purchase Order) from the date of Purchase Order, penalty at 0.5% (half percent) per week or part thereof, limited to a maximum of 5% (five percent) of the basic material value of the Purchase Order will be applicable.

For delay in delivery: In the event of delay in agreed contractual delivery as per Purchase Order, penalty @ 0.5 % (half percent) per week or part thereof but limited to a max of 10% (ten percent) value of undelivered portion (basic material cost) will be applicable. Delivery will commence from the date of document approval by customer / BHEL or date of issue of manufacturing clearance, whichever is later. The date for which Inspection call is issued by vendor along with test certificates / test reports / Certificate of Conformance / calibration reports, as proof of completion of manufacturing will be treated as date of deemed delivery for penalty calculation. In the absence of furnishing such document indicated above as proof of completion of manufacturing along with inspection call, actual date of inspection will be considered as date of deemed delivery and BHEL will not be responsible for delay in actual date of inspection.

Penalty for delayed documentation/delayed delivery, if applicable, shall be deducted at the time of first payment. If penalty is applicable for duration of less than a week, penalty @ 0.5% (half percent) of the basic material value will be deducted.
6. **Contract variations (Increase or decrease in the scope of supply):** BHEL may vary the contracted scope as per requirements at site. If vendor is of the opinion that the variation has an effect on the agreed price or delivery period, BHEL shall be informed of this immediately in writing along with technical details. Where unit rates are available in the Contract, the same shall be applied to such additional work. Vendor shall not

perform additional work before BHEL has issued written instructions / amendment to the Purchase Order to that effect. The work which the vendor should have or could have anticipated in terms of delivering the service(s) and functionality (i.e.) as described in this agreement, or which is considered to be the result of an attributable error on the vendor's part, shall not be considered additional work.

7. Reverse Auction: BHEL reserves the right to follow REVERSE AUCTION PROCEDURE (ONLINE BIDDING ON NETWORK) before finalising the Purchase order on technically competent bidders, as per the guidelines given in Annexure III. In case BHEL decides not to conduct RA, the envelope sealed price bids of all techno-commercially qualified bidders, along with price impact, if any, shall be opened and processed as per BHEL's standard practice.
8. Inspection: Prior written notice of at least 10 days shall be given along with internal test certificates / COC and applicable test certificates. Materials will be inspected by BHEL-EDN-QS/CQS or BHEL nominated Third Party Inspection Agency (TPIA) or BHEL authorized Inspection Agency or Customer / Consultant or jointly by BHEL & Customer / consultant. All tests have to be conducted as applicable in line with approved Quality plan or QA Checklist or Purchase specification and original reports shall be furnished to BHEL-EDN, Bangalore for verification / acceptance for issue of dispatch clearance.
All costs related to inspections & re-inspections shall be borne by vendor. Whether the Contract provides for tests on the premises of the vendor or any of his Sub-contractor/s, vendor shall be responsible to provide such assistance, labour, materials, electricity, fuels, stores, apparatus, instruments as may be required and as may be reasonably demanded to carry out such tests efficiently. Cost of any type test or such other special tests shall be borne by BHEL only if specifically agreed to in the purchase order.
9. Transit Insurance: Transit insurance coverage between vendor's works and project site shall be to the account of BHEL, unless specifically agreed otherwise. However, vendor shall send intimation directly to insurance agency (as mentioned in dispatch instructions issued by BHEL) through fax/courier/e-mail, immediately on dispatch of goods for covering insurance. A copy of such intimation sent by vendor to insurance agency shall be given to BHEL along with dispatch documents. Dispatch documents will be treated as incomplete without such intimation copy. BHEL shall not be responsible for sending intimations to insurance agency on behalf of the vendor.
10. High Sea Sales (HSS): Customs clearance of the consignment landed on Indian Sea / Air ports will be done by BHEL based on the original HSS documents provided by vendors.
Any delay in submission of complete / correct HSS documents to BHEL may incur demurrage charges. All demurrage charges on account of incomplete / incorrect HSS documents submission by vendor will be to vendor's account and all such charges will be recovered from any of the available vendor bills with BHEL.
11. Packaging and dispatch: The Seller shall package the goods safely and carefully and pack them suitably in all respects considering the peculiarity of the material for normal safe transport by Sea / Air / Rail / Road to its destination suitably protected against loss, damage, corrosion in transit and the effect of tropical salt laden atmosphere. The packages shall be provided with fixtures / hooks and sling marks as may be required for easy and safe handling. If any consignment needs special handling instruction, the same shall be clearly marked with standard symbols / instructions. Hazardous material should be notified as such and their packing, transportation and other protection must conform to relevant regulations.
The packing, shipping, storage and processing of the goods must comply with the prevailing legislation and regulations concerning safety, the environment and working conditions. Any Imported/Physical Exports items packed with raw / solid wood packing material should be treated as per ISPM – 15 (fumigation) and accompanied by Phytosanitary / Fumigation certificate. If safety information sheets (MSDS – Material Safety Data Sheet) exist for an item or the packaging, vendor must provide this information without fail along with the consignment.
Each package must be marked with Consignee name, Purchase order number, Package number, Gross weight and net weight, dimensions (L x B x H) and Seller's name. Packing list of goods inside each package with PO item number and quantity must also be fixed securely outside the box to indicate the contents of each box. Total number of packages in the consignment must also be indicated.
Separate packing & identification of items should be as follows.
 1. Main Scope - All items must be tagged with part no. & item description.
 2. Commissioning spares - All items must be tagged with part no. & item description.

3. Mandatory spares - All items must be tagged with part no. & item description.
12. Assignment of Rights & Obligations; Subcontracting: Vendor is not permitted to subcontract the delivery or any part thereof to third party or to assign the rights and obligations resulting from this agreement in whole or in part to third parties without prior written permission from BHEL. Any permission or approval given by the BHEL shall, however, not absolve the vendor of the responsibility of his obligations under the Contract.
13. Progress report: Vendor shall render such report as to the progress of work and in such form as may be called for by the concerned purchase officer from time to time. The submission and acceptance of such reports shall not prejudice the rights of BHEL in any manner.
14. Non-disclosure and Information Obligations: Vendor shall provide with all necessary information pertaining to the goods as it could be of importance to BHEL. Vendor shall not reveal confidential information that may be divulged by BHEL to Vendor's employees not involved with the tender/ contract & its execution and delivery or to third parties, unless BHEL has agreed to this in writing beforehand. Vendor shall not be entitled to use the BHEL name in advertisements and other commercial publications without prior written permission from BHEL.
15. Cancellation / Termination of contract: BHEL shall have the right to completely or partially terminate the agreement by means of written notice to that effect. Termination of the Contract, for whatever reason, shall be without prejudice to the rights of the parties accrued under the Contract up to the time of termination.
BHEL shall have the right to cancel/foreclose the Order/ Contract, wholly or in part, in case it is constrained to do so, on account of any decline, diminution, curtailment or stoppage of the business.
16. Risk Purchase Clause: In case of failure of supplier, BHEL at its discretion may make purchase of the materials / services NOT supplied / rendered in time at the RISK & COST of the supplier. Under such situation, the supplier who fails to supply the goods in time shall be wholly liable to make good to BHEL any loss due to risk purchase.
In case of items demanding services at site like erection and commissioning, vendor should send his servicemen /representatives within 7 days from the service call. In case a vendor fails to attend to the service call, BHEL at its discretion may also make arrangements to attend such service by other parties at the **RISK & COST** of the supplier. Under such situation the supplier who fails to attend the service shall be wholly liable to make good to BHEL any loss due to risk purchase / service including additional handling charges due to the change.
17. Shortages: In the event of shortage on receipt of goods and/or on opening of packages at site, all such shortages shall be made good within a reasonable time that BHEL may allow from such intimation and free of cost. In case BHEL raises an insurance claim, the cost of material limited to insurance settled amount less handling charges will have to be reimbursed by the Supplier.
Transit Damages: In the event of receipt of goods in damaged condition or having found them so upon opening of packages at site, Supplier shall make good of all such damages within a reasonable time from such intimation by BHEL. In case BHEL raises an insurance claim, the cost of material limited to insurance settled amount less handling charges will be reimbursed.
18. Remedial work: Notwithstanding any previous test or certification, BHEL may instruct the vendor to remove and replace materials/goods or remove and re-execute works/services which are not in accordance with the purchase order. Similarly BHEL may ask the vendor to supply materials or to execute any services which are urgently required for any safety reasons, whether arising out of or because of an accident, unforeseeable event or otherwise. In such an event, Vendor shall provide such services within a reasonable time as specified by BHEL.
19. Indemnity Clause: Vendor shall comply with all applicable safety regulations and take care for the safety of all persons involved. Vendor is fully responsible for the safety of its personnel or that of his subcontractor's men / property, during execution of the Purchase Order and related services. All

statutory payments including PF, ESI or other related charges have to be borne by the vendor. Vendor is fully responsible for ensuring that all legal compliances are followed in course of such employment.

20. Product Information, Drawings and Documents: Drawings, technical documents or other technical information received by Vendor from BHEL or vice versa shall not, without the consent of the other party, be used for any other purpose than that for which they were provided. They may not, without the consent of the Disclosing party, otherwise be used or copied, reproduced, transmitted or communicated to third parties. All information and data contained in general product documentation, whether in electronic or any other form, are binding only to the extent that they are by reference expressly included in the contract.

Vendor, as per agreed date/s but not later than the date of delivery, provide free of charge information and drawings which are necessary to permit and enable BHEL to erect, commission, operate and maintain the product. Such information and drawings shall be supplied in as many numbers of copies as may be agreed upon.

All intellectual properties, including designs, drawings and product information etc. exchanged during the formation and execution of the Contract shall continue to be the property of the disclosing party.

21. Intellectual Property Rights, Licenses: If any Patent, design, Trade mark or any other intellectual property rights apply to the delivery (goods / related service) or accompanying documentation shall be the exclusive property of the Vendor and BHEL shall be entitled to the legal use thereof free of charge by means of a non-exclusive, worldwide, perpetual license. All intellectual property rights that arise during the execution of the Purchase Order/ contract for delivery by vendor and/or by its employees or third parties involved by the vendor for performance of the agreement shall belong to BHEL. Vendor shall perform everything necessary to obtain or establish the above mentioned rights. The Vendor guarantees that the delivery does not infringe on any of the intellectual property rights of third parties. The Vendor shall do everything necessary to obtain or establish the alternate acceptable arrangement pending resolution of any (alleged) claims by third parties. The Vendor shall indemnify BHEL against any (alleged) claims by third parties in this regard and shall reimburse BHEL for any damages suffered as a result thereof.

22. Force Majeure: Notwithstanding anything contained in the purchase order or any other document relevant thereto, neither party shall be liable for any failure or delay in performance to the extent said failures or delays are caused by the "Act of God" and occurring without its fault or negligence, provided that, force majeure will apply only if the failure to perform could not be avoided by the exercise of due care and vendor doing everything reasonably possible to resume its performance.

A party affected by an event of force majeure which may include fire, tempest, floods, earthquake, riot, war, damage by aircraft etc., shall give the other party written notice, with full details as soon as possible and in any event not later than seven (7) calendar days of the occurrence of the cause relied upon. If force majeure applies, dates by which performance obligations are scheduled to be met will be extended for a period of time equal to the time lost due to any delay so caused.

Notwithstanding above provisions, in an event of Force Majeure, BHEL reserves for itself the right to cancel the order/ contract, wholly or partly, in order to meet the overall project schedule and make alternative arrangements for completion of deliveries and other schedules.

23. Guarantee / Warranty: Wherever required, and so provided in the specifications / Purchaser Order, the Seller shall guarantee that the stores supplied shall comply with the specifications laid down, for materials, workmanship and performance. Unless otherwise specified, guarantee / warranty period shall be 30 months after the date of delivery of goods or 24 months from the date of commissioning of goods whichever is earlier. The guarantee / warranty period as described above shall apply afresh to replaced, repaired or re-executed parts of a delivery. Unless otherwise specifically provided in the Purchase Order, Vendor's liability shall be co terminus with the expiration of the applicable guarantee / warranty period.

24. Limitation of Liability: Vendor's liability towards this contract is limited to a maximum of 100% of the contract value and consequential damages are excluded. However the limits of liability will have no effect in cases of criminal negligence or wilful misconduct.
The total liability of Vendor for all claims arising out of or relating to the performance or breach of the Contract or use of any Products or Services or any order shall not exceed the total Contract price.
25. Liability during guarantee / warranty: Vendor shall arrange replacement / repair of all the defective materials / services under its obligation under the guarantee / warranty period. The rejected goods shall be taken away by vendor and replaced / repaired. In the event of the vendor's failure to comply, BHEL may take appropriate action including disposal of rejections and replenishment by any other sources at the cost and risk of the vendor.
In case, defects attributable to vendor are detected during first time commissioning or use, vendor shall be responsible for replacement / repair of the goods as required by BHEL at vendor's cost. In all such cases expiry of guarantee / warranty will not be applicable.
26. Liability after guarantee / warranty period: At the end of the guarantee / warranty, the Vendor's liability ceases except for latent defects (latent defects are defects / performance issues notices after the guarantee / warranty has expired). The Contractor's liability for latent defects warranty for the plant and equipment including spares shall be limited to a period of six months from the end of the guarantee / warranty period of the respective plant and equipment including spares or first time commissioning whichever is later but not later than 3 (three) years from the date of shipment.
27. Compliance with Laws: Vendor shall, in performing the contract, comply with all applicable laws. The vendor shall make all remittances, give all notices, pay all taxes, duties and fees, and obtain all permits, licences and approvals, as required by the laws in relation to the execution and completion of the contract and for remedying of any defects; and the Contractor shall indemnify and hold BHEL harmless against and from the consequences of any failure to do so.
28. Settlement of Disputes: Except as otherwise specifically provided in the Purchase Order, decision of BHEL shall be binding on the vendor with respect to all questions relating to the interpretation or meaning of the terms and conditions and instructions herein before mentioned and as to the completion of supplies/work/services, other questions, claim, right, matter or things whatsoever in any way arising out of or relating to the contract, instructions, orders or these conditions or otherwise concerning the supply or the execution or failure to execute the order, whether arising during the schedule of supply/work or after the completion or abandonment thereof. Any disputes or differences among the parties shall to the extent possible be settled amicably between the parties thereto, failing which the disputed issues shall be settled through arbitration. Vendor shall continue to perform the contract, pending settlement of dispute(s).

29. Arbitration Clause: In case amicable settlement is not reached in the event of any dispute or difference arising out of the execution of the Contract or the respective rights and liabilities of the parties or in relation to interpretation of any provision in any manner touching upon the Contract, such dispute or difference shall (except as to any matters, the decision of which is specifically provided for therein) be referred by either party to the sole arbitration of an Arbitrator appointed by the Executive Director/ General Manager of the purchasing unit/ region/ division of BHEL. Vendor shall have no objection even if the Arbitrator so appointed is an employee of BHEL or has ever dealt/ had to deal with any matter relating to this Contract.

Subject as aforesaid the provisions of the Arbitration and Conciliation Act, 1996 of India or any statutory modification or re-enactment thereof and the rules made there under and for the time being in force shall apply to the arbitration proceedings under this clause. It is a term of contract that the party initiating arbitration shall specify the dispute or disputes to be referred to arbitration under this clause together with the amount or amounts claimed in respect of each such dispute. The venue for the arbitration shall be Bangalore, India. The award of the arbitrator shall be a speaking award and shall be final, conclusive and binding on all parties to this contract.

The cost of arbitration shall be borne equally by the parties. Notwithstanding the existence of any dispute or difference or any reference for the arbitration, the vendor shall proceed with and continue without hindrance the performance of the work under the contract with due diligence and expedition in a professional manner.

30. Applicable Laws and Jurisdiction of Courts: Prevailing Indian laws both substantive and procedural, including modifications thereto, shall govern the Contract. Subject to the conditions as aforesaid, the competent courts in BANGALORE alone shall have jurisdiction to consider over any matters touching upon this contract.

31. General Terms: That any non-exercise, forbearance or omission of any of the powers conferred on BHEL and /or any of its authorities will not in any manner constitute waiver of the conditions hereto contained in these presents.

That the headings used in this agreement are for convenience of reference only.

That all notices etc., to be given under the Purchase order shall be in writing, type script or printed and if sent by registered post or by courier service to the address given in this document shall be deemed to have been served on the date when in the ordinary course, they would have been delivered to the addressee.

ANNEXURE - I
LIST OF INTERNATIONAL GATEWAY AIRPORTS

For airbased consignment, terms of delivery will be on FCA basis from following listed airports only.
This list is valid from 01.03.2013 to 28.02.2015. Vendors are requested to verify this list for use after 28.02.2015.

SCHEDULE NO	COUNTRY	CURRENCY CODE	AIRPORT
D01	UK	GBP	LONDON (HEATHROW)
D02	UK	GBP	NEW CASTLE
D03	UK	GBP	OXFORD. CHETLAM
D04	UK	GBP	BRISTOL. WELLINGBOROUGH
D05	UK	GBP	BIRMINGHAM
D06	UK	GBP	EAST MIDLANDS
D07	UK	GBP	MANCHESTER
D08	UK	GBP	LEEDS
D09	UK	GBP	GLASGOW
D10	FRANCE	EURO	PARIS (ROISSY) & LYON
D11	SWEDEN	EURO	STOCKHOLM
D12	SWEDEN	EURO	GOTHENBERG & MALMO
D13	ITALY	EURO	ROMA, MILAN
D14	ITALY	EURO	TURIN, BOLOGNA, FLORENCE
D15	NETHERLANDS	EURO	AMSTERDAM, ROTTERDAM
D16	AUSTRIA	EURO	VIENNA, LINZ, GRAZ
D17	BELGIUM	EURO	ANTWERP, BRUSSELS
D18	DENMARK	DKK	COPENHAGEN
D19	JAPAN	JPY	TOKYO, OSAKA
D20	SINGAPORE	SGD	SINGAPORE
D21	CANADA	CAD	TORONTO
D22	CANADA	CAD	MONTREAL
D23	USA	USD	NEW YORK, BOSTON
D24	USA	USD	CHICAGO
D25	USA	USD	SAN FRANCISCO, LOS ANGELES
D26	USA	USD	ALANTA, HOUSTON
D27	GERMANY	EURO	MUNICH, KOLN, DUSSELDORF, HANNOVER, HAMBURG, STUTTGART, DAMSTADT, MANIHIEM, NURUMBERG
D28	GERMANY	EURO	FRANKFURT
D29	GERMANY	EURO	BERLIN
D30	SWITZERLAND	SFR	BASLE, ZURICH, GENEVA
D31	SPAIN	EURO	BARCELONA
D32	AUSTRALIA	AUD	SYDNEY
D33	AUSTRALIA	AUD	MELBOURNE
D34	AUSTRALIA	AUD	PERTH
D35	CZECH	EURO	PRAGUE
D36	HONG KONG	HKD	HONG KONG
D37	NEW ZELAND	NZD	AUCKLAND
D38	RUSSIA	USD	MOSCOW
D39	SOUTH KOREA	USD	KIMPO INTERNATIONAL, INCHEON
D40	FINLAND	EURO	HELSINKI
D41	ROMANIA	EURO	BUCHAREST
D42	NORWAY	EURO	OSLO
D43	IRELAND	EURO	DUBLIN
D44	ISRAEL	USD	TEL AVIV
D45	UAE	USD	DUBAI
D46	OMAN	USD	MUSCAT
D47	EGYPT	USD	CAIRO
D48	TAIWAN	USD	TAIPEI
D49	UKRAINE	USD	KIEV
D50	CHINA	USD	SHANGHAI, SHENZHEN
D51	PHILIPINES	USD	MANILA
D52	MALAYSIA	USD	KUALALUMPUR, PE NANG
D53	CYPRUS	USD	LARNACA
D54	SOUTH AFRICA	USD	JOHANNESBERG, DURBAN
D55	SLOVAKIA	EURO	BARTISLOVA
D56	SAUDI ARABIA	SAR	RIYADH
D57	TURKEY	EURO	ISTANBUL
D58	THAILAND	USD	BANGKOK
D59	BRAZIL	USD	SAO PAULO, RIO DE JANEIRO

ANNEXURE – II
DISCREPANCY IN WORDS & FIGURES – QUOTED IN PRICE BID

Following guidelines will be followed in case of discrepancy in words & figures-quoted in price bid:

(a) If, in the price structure quoted for the required goods/services/works, there is discrepancy between the unit price and the total price (which is obtained by multiplying the unit price by the quantity), the unit price shall prevail and the total price corrected accordingly, unless in the opinion of the purchaser there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price corrected accordingly.

(b) If there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; and

(c) If there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to (a) and (b) above.

(d) If there is such discrepancy in an offer, the same shall be conveyed to the bidder with target date upto which the bidder has to send his acceptance on the above lines and if the bidder does not agree to the decision of the purchaser, the bid is liable to be ignored.

ANNEXURE-III
GUIDELINES FOR REVERSE AUCTION PROCEDURE

Against this enquiry for the subject item/ system with detailed scope of supply as per enquiry specifications, BHEL may resort to “REVERSE AUCTION PROCEDURE” i.e., ON LINE BIDDING (THROUGH A SERVICE PROVIDER). The Reverse Auction shall follow the philosophy of English Reverse (No ties).

1. For the proposed reverse auction, only techno-commercially qualified bidders shall be eligible to participate.
2. Those bidders who have given their acceptance with the offer for participation in Reverse Auction will have to necessarily submit ‘Process compliance form’ (to the designated service provider) as well as ‘Online sealed bid’ in the Reverse Auction. Non-submission of ‘Process compliance form’ or ‘Online sealed bid’ by the bidder will be considered as tampering of the tender process and will invite action by BHEL as per extend guidelines for suspension of business dealings with suppliers/contractors (as available on www.bhel.com).
3. BHEL will engage the services of a service provider who will provide all necessary training and assistance before commencement of on line bidding on internet.
4. In case of reverse auction, BHEL will inform the bidders the details of Service Provider to enable them to contact & get trained.
5. Business rules like event date, time, bid decrement, extension etc. also will be communicated through service provider for compliance.
6. Bidders have to submit the signed Compliance form before start of Reverse auction, to the service provider. Without this, the bidder will not be eligible to participate in the event.
7. In line with the NIT terms, BHEL will provide the calculation sheet (e.g., EXCEL sheet) which will help to arrive at “Total Cost to BHEL” like Packing & forwarding charges, Taxes and Duties, Freight charges, Insurance, Service Tax for Services and loading factors (for non-compliance to BHEL standard Commercial terms & conditions) for each of the bidder to enable them to fill-in the price and keep it ready for keying in during the Auction.
8. Reverse auction will be conducted on scheduled date & time.
9. At the end of Reverse Auction event, the lowest bidder value will be known on auction portal.
10. The successful bidder shall be required to submit the final prices (L1) in prescribed format for price breakup including that of line items, if required, quoted during the Online Reverse Auction, duly signed and stamped as token of acceptance without any new condition (other than those already agreed to before start of auction), after completion of auction to Service provider besides BHEL within two working days of Auction without fail.
11. Any variation between the final bid value and that in the confirmatory signed price breakup document will be considered as tampering the tender process and will invite action by BHEL as per extant guidelines for suspension of business dealing (as available on www.bhel.com)
12. In case BHEL decides not to conduct Reverse Auction for this tender enquiry, the Price bids and price impacts, if any, already submitted and available with BHEL shall be opened as per BHEL’s standard practice.
13. Bidders shall be required to read the “Terms and Conditions” section of the auctions site of Service provider, using the Login IDs and passwords given to them by the service provider before reverse auction event. Bidders should acquaint themselves of the “Business Rules of Reverse Auction”, which will be communicated before the Reverse Auction.

ANNEXURE-III
GUIDELINES FOR REVERSE AUCTION PROCEDURE

14. The Bidder shall not divulge either his Bids or any other exclusive details of BHEL to any other party. If the Bidder or any of his representatives are found to be involved in Price manipulation/ cartel formation of any kind, directly or indirectly by communicating with other bidders, action as per extant BHEL guidelines for suspension of business dealings (as available on www.bhel.com), shall be initiated by BHEL and the results of the RA scrapped/ aborted.
15. In case BHEL decides to go for reverse auction, the H1 bidder (whose quote is highest in online sealed bid) may not be allowed to participate in further RA process. In case of tie for H1 bid (identical online sealed bids), 15 minutes additional time shall be provided so as to break the tie.

ANNEXURE - IV
Electronic Funds Transfer (EFT) OR
Paylink Direct Credit Form

Please Fill up the form in **CAPITAL LETTERS** only.

TYPE OF REQUEST(Tick one): ☐ CREATE ☐ CHANGE

BHEL Vendor / Supplier Code:	
Company Name :	
Permanent Account Number(PAN):	
Address	

City:	PINCODE	STATE
-------	---------	-------

Contact Person(s)	
Telephone No:	
Fax No:	
e-mail id:	

1 Bank Name:	
2 Bank Address:	
3 Bank Telephone No:	
4 Bank Account No:	
5 Account Type: Savings/Cash Credit	
6 9 Digit Code Number of Bank and branch appearing on MICR cheque issued by Bank	
7 Bank IFSC Code(applicable for NEFT)	
8 Bank IFSC code(applicable for RTGS)	(Indian Financial System Code)

- A I hereby certify that the particulars given above are true, correct and complete and that I, as a representative for the above named Company, hereby authorise BHEL, EDN, Bangalore to electronically deposit payments to the designated bank account.
- B If the transaction is delayed or not effected at all for reasons of incomplete or incorrect information, I would not hold BHEL / transferring Bank responsible.
- C This authority remains in full force until BHEL, EDN, Bangalore receives written notification requesting a change or cancellation.
- D I have read the contents of the covering letter and agree to discharge the responsibility expected of me as a participant under ECS / EFT.

Date:

Authorised Signatory:

Designation:

Telephone No. with STD Code

Company Seal

Bank Certificate

We certify that _____ has an Account No _____ with us and we confirm that the bank details given above are correct as per our records.

Date:

(.....)

Place:

Signature

Please return completed form **along with a blank cancelled cheque or photocopy** thereof to:

Bharath Heavy Electricals Ltd,

Attn:

Electronics Division, Mysore Road,

BANGALORE - 560 026

In case of any Query, please call concerned purchase executive.

ANNEXURE - V
PRESENT PROCEDURE FOR SALE IN TRANSIT (HIGH SEA SALES)

In case of High Sea Sales, vendor should submit following documents:

1. ORIGINAL HIGH SEA SALES AGREEMENT

- Sale agreement (on Rs. 200/- non-judicial stamp paper & notarised with 2 witnesses with identity) has to be signed between BHEL and the Party importing material. The date of the sale documents should be in between the date of House Air Way Bill / Bill of Lading and before landing of the goods in Indian origin.
- The date of the stamp paper should be prior to the Air Way Bill / Bill of Lading date.
- Following shall be included in the High Sea Sales Agreement:
“THE BUYER ALSO UNDERTAKE DISCHARGES, THE OBLIGATION AND FULFILLMENT OF CONDITIONS, IF ANY, ATTACHED TO THE IMPORTATION, ASSESSMENT AND CLEARANCE OF THE GOODS IN TERMS CUSTOMS TARIFF ACT 1975, THE CUSTOMS ACT 1962 & RULES & REGULATIONS MADE THERE UNDER AND OTHER RELEVANT ACTS, ORDERS, NOTIFICATIONS”.

2. ORIGINAL INVOICES: INDIGENOUS RUPEE INVOICE & FOREIGN CURRENCY INVOICE

- Prices should be C.I.F., designated airport/seaport basis.
- I.E.C., C.S.T., K.S.T. Nos. to be mentioned.
- Description of item (Nomenclature), Unit & Quantity in both the Foreign Currency & the Indigenous Invoice in Rupee shall be exactly as per Purchase Order Description of item, Quantity and Unit. The Indigenous Invoice value shall be exactly as per Purchase Order value.
- Seller should give Foreign Currency Invoice from the original consignor. The Foreign Currency Invoice value should be at least 2% (two per cent) less than the Indigenous Rupee Invoice value in equivalent foreign currency.

4. ORIGINAL HOUSE AIR WAY BILL/ BILL OF LADING

- The sale agents should duly endorse House Air Way Bill (HAWB) for air shipments or original Bill of Lading (O.B.L.) for sea shipments and Foreign Currency Invoice in favour of BHEL-EDN.

5. ORIGINAL CARGO ARRIVAL NOTICE FROM FORWARDER.

6. ORIGINAL DELIVERY ORDER ISSUED IN NAME OF BHEL-EDN.

7. ORIGINAL PACKING LIST.

8. A LETTER TO THE COMMISSIONER OF CUSTOMS FOR EFFECTING ABOVE SALE.

9. A LETTER TO THE DEPUTY ASSESSOR (OCTROI) FOR EFFECTING ABOVE SALE IN FAVOUR OF BHEL.

REMARKS: In case vendor needs any clarifications on the above, the same may be sought in writing.



ELECTRONICS DIVISION, BANGALORE

Annexure-VI

BHEL MEMBER BANKS (LIST OF CONSORTIUM BANKS)

BANK GUARANTEE (BG) SHALL BE ISSUED FROM THE FOLLOWING BANKS ONLY:

	Nationalised Banks		Nationalised Banks
1	Allahabad Bank	19	Vijaya Bank
2	Andhra Bank		Public Sector Banks
3	Bank of Baroda	20	IDBI
4	Canara Bank		Foreign Banks
5	Corporation Bank	21	CITI Bank N.A
6	Central Bank	22	Deutsche Bank AG
7	Indian Bank	23	The Hongkong and Shanghai Banking Corporation Ltd. (HSBC)
8	Indian Overseas Bank	24	Standard Chartered Bank
9	Oriental Bank of Commerce	25	The Royal Bank of Scotland N.V.
10	Punjab National Bank	26	J P Morgan
11	Punjab & Sindh Bank		Private Banks
12	State Bank of India	27	Axis Bank
13	State Bank of Hyderabad	28	The Federal Bank Limited
14	Syndicate Bank	29	HDFC Bank
15	State Bank of Travancore	30	Kotak Mahindra Bank Ltd
16	UCO Bank	31	ICICI Bank
17	Union Bank of India	32	IndusInd Bank
18	United Bank of India	33	Yes Bank

Note:

- All BGs must be issued from BHEL consortium banks listed above.
- BHEL may accept BG from other Nationalised Banks also which are not listed above.
- BG will not be accepted from Scheduled Banks and Co-operative Banks.
- In case BG is issued from a bank located outside Indian territory and is issued in foreign currency, the BG must be routed through and confirmed by any one of the above mentioned consortium banks or any of the Indian Public Sector Banks.
- This list is subject to changes. Hence vendors are requested to check this list every time before issuing BGs.



Electronics Division, Bangalore

ANNEXURE-VII
PROFORMA OF PERFORMANCE BANK GUARANTEE
(For Bank Guarantees issued in Indian Rupees by Banks in India)

Note:

- To be executed in Rs. 100/- Non-Judicial stamp paper.
- To be submitted by issuing bank to Purchase Dept. directly. Please give BHEL address to banker.
- Do not enclose with Bank document.
- Modifications and additions/deletions to this BG format are not permitted.

PERFORMANCE GUARANTEE (PROFORMA OF BANK GUARANTEE)

Ref no: (BG No.) _____

THIS DEED OF GUARANTEE made and executed on the _____ day of _____ (month & year), by the _____ (Bank), registered under the Companies Act 1956/Nationalised Bank constituted under the Banking Companies (acquisition and transfer of undertakings) Act constituted under the **State Bank of India Act / Subsidiary Banks Act**, having its registered / head office at _____ represented herein by its Branch Manager / authorised representatives Sri. _____ & Sri. _____ (Hereinafter called 'guarantor' which term shall mean and include its successors and assigns)

IN FAVOUR OF BHARAT HEAVY ELECTRICALS LIMITED

_____ (Buyer's Name), a company registered under the companies Act, 1956 having its registered office at BHEL House at Siri Fort, New Delhi-110 049 and its Electronics Division at Mysore Road, Bangalore - 26 (hereinafter referred to as the 'Company' Which term shall include its successors and assigns):

Whereas the company has placed an order on _____ (State the name of the company / firm and its address) (hereinafter referred to as the 'Supplier' which term shall mean and include its liquidators, successors and assign) for the supply of system under order / Contract No _____ Dtd _____.

AND WHEREAS the supplier has agreed to supply the materials and carryout the works as detailed and in accordance with the terms set out in the said order / contract.

**Electronics Division, Bangalore**

AND WHEREAS the company is not required to pay to the supplier a sum of Rupees _____ being the 10% of the value of the goods supplied / Works performed / Services rendered under the said order / contract between the supplier and the company, till the company is satisfied with the mechanical Warranties and the performance standards stipulated in the said order / contract between the company and the supplier has been duly fulfilled, except, against a Bank Guarantee for the said sum of Rs. _____ in favour of the company by reputed Bank, in which case the company has agreed to make payment to the supplier of the said sum of Rupees _____ being (10%) of the value of the goods supplied / Works performed / Services rendered under the agreement between the supplier and the company and the Guarantor has at the request of the supplier, agreed to furnish this Guarantee subject to the terms and conditions stated below :

NOW THIS DEED WITNESSES THAT IN pursuance of the above said agreement, the guarantor hereby agrees and covenants with company is as follows:

- 1) That during the period this contract of Guarantee remains effectual, the guarantor shall be liable in respect of the amount due and owing to the company in respect of the payments to the extent of Rs _____ (in words) _____ against any loss or damage caused to or suffered by the company by reasons of any breach of the terms of the said order / contract / Agreement by the supplier
- 2) The Guarantor hereby undertakes to pay the amounts and payable under this guarantee without any demur, merely on demand from the company intimating that the amount claimed is due by way of loss or damage caused to or suffered or would be caused or suffered by any terms contained in the said order/contract. Any such demand made on the guarantor shall be conclusive as regards the amount due and payable by the Guarantor irrespective of the fact whether the contractor/supplier admits or denies.
- 3) The Guarantor further agrees that the agreement herein contained shall remain in force and effect till all supplies to be made /works to be performed / services to be rendered under the said order /contract /agreement are completed to the entire satisfaction of the company or till company certifies that the terms and conditions of the said order / contract agreement have been fully and



Electronics Division, Bangalore

properly carried out by the said supplier and accordingly discharges the Guarantee. Unless a demand or claim under this guarantee is made on the guarantor in writing on or before the expiry of claim period indicated in clause 6 below, the guarantor shall be discharged from all the liability under this guarantee thereafter.

- 4) The guarantor further agrees with the company that the company shall have the fullest liberty without the consent of the guarantor and without effecting in any manner the obligations of the guarantor hereunder to vary any of the terms of the said order / contract / agreement or extend the time of performance by the said supplier from time to time or refrain from exercising the power exercisable by the company against the said supplier or to forebear or omit to enforce any of the terms and conditions relating to the said order / contract / agreement, and the guarantor shall not be relieved of its liability in whole or in part, by reason of any act, commission or forbearance on the part of the company or by reason of any such variation, or extension being granted to the said supplier or by reason of any such matter or thing whatsoever which under the law relating to sureties would but for this provision have effect of so relieving the guarantor.
- 5) The guarantor undertakes not to revoke this guarantee during its currency except with the previous consent of the company in writing.
- 6) Notwithstanding anything herein above obtained, the liability of the guarantor under these presents is restricted to Rs. _____. The guarantee shall be in force till its expiry on _____ unless a demand is made on the guarantor within SIX months from the date of expiry, all the liability of the guarantor under this guarantee shall stand fully discharged. The decision of the claimant in regard to breach of contract is final and binding on the Bank.

IN WITNESS whereof, the guarantor, acting through its authorised representative has executed this deed of Guarantee on the day, month and year first above written.

(Seal of the Bank to be affixed)
For & On behalf of _____ Bank
Signature of authorized person with
seal & designation

WITNESS:

- 1.
- 2.



Electronics Division, Bangalore

ANNEXURE-VIII
PROFORMA OF PERFORMANCE BANK GUARANTEE
(For Bank Guarantees issued in Foreign Currency by Banks located outside India)

BANK NAME AND ADDRESS

Electronics Division
Bharat Heavy Electrical Limited (B.H.E.L.),
Mysore Road, P.B. No. 2606,
Bangalore- 560 026

Dear Sir,

Sub : CONTRACT PERFORMANCE GUARANTEE Ref no. Dtd.....

WHEREAS you have entered into a contract reference No & PO NO. _____
Date _____ with M/s _____ having its registered office at
_____ for the supply of _____ as detailed in your purchase
order No. _____ which is hereinafter referred to as "the said contract" and WHEREAS M/s
_____ has undertaken to produce a Bank Guarantee for 10% (Ten Percent)
of the contract price amounting to _____
(_____) to secure its obligations to Electronics Division, BHEL
having its registered office at New Delhi for the performance of the contract including the warranty of the
equipment supplied, We _____ Bank,
_____ hereby expressly, irrevocably and unreservedly undertake and
guarantee as principal obligors on behalf of M/s _____ that in the event Bharat
Heavy Electricals Ltd. (B.H.E.L.) declares to us in writing that M/s _____
has not fulfilled any obligors according to the contractual obligation of the said contract, to pay you on
demand and without demur to Bharat Heavy Electricals Ltd., Electronics Division, Mysore Road, P.B.No.
2606, Bangalore - 560 026., India an amount of _____
(in words _____) subject to
as may be determined below :

1. Notwithstanding any right M/s. _____ may have directly against or any
disputes raised by M/s. _____
_____, Your written demand shall be conclusive
evidence to us that repayment is due under the terms of the said contract and shall be binding on
us.



Electronics Division, Bangalore

2. We shall not be discharged or released from this undertaking and Guarantee by any arrangements, variations made between you and M/s. _____ with or without our consent and knowledge or by any alteration in the obligations of M/s. _____ by any forbearance whether as to payment, time, performance or otherwise.
3. This guarantee shall remain valid until the end of six months after the close of the warranty period or until the same is reported by BHEL to us whichever is earlier.
4. We agree and undertake not to revoke this guarantee during its validity unless discharged in writing by you subject to the provision of clause (7) below :
5. This guarantee shall be a continuing guarantee subject to the foregoing and shall not be discharged by any change in the constitution of the Bank or M/s. _____ .
6. This guarantee shall be governed by and constructed in accordance with the Laws of India.
7. At any time _____ Bank may render this guarantee null and void by paying to Bharat Heavy Electricals Ltd. the full amount being _____ (in words _____)
_____)

**For and On behalf of Bank
By its Authorised Signatory**

Annexure - IX
Certificate by Chartered Accountant on Letter Head

This is to certify that M/s
.....(Hereinafter referred to as 'Company')
having its registered office at is registered under MSMED Act 2006,
(Entrepreneur Memorandum No (Part-II dtd
Category: (Micro/Small). (Copy enclosed).

Further verified from the Books of Accounts that the investment of the company as
on date..... **as per MSMED Act 2006 is as follows:**

- 1. For Manufacturing Enterprises:** Investment in plant and machinery (i.e., original cost excluding land and building and the items specified by the Ministry of Small Industries vide its notification No.S.O.1722 (E) dated October 5, 2006:
- 2. For Service Enterprises:** Investment in equipment (original cost excluding land and building and furniture, fittings and other items not directly related to the service rendered or as may be notified under the MSMED Act, 2006:
Rs.Lacs.

The above investment of Rs. Lacs in within permissible limit of
Rs..... Lacs for.....Micro / Small (Strike off which is not
applicable) Category under MSMED Act 2006.

Date:

(Signature)

Name -

Membership Number -

Seal of Chartered Accountant

Guidelines for Indian Agents
ANNEXURE - X

- Definition of Indian Agent: An Indian Agent of foreign principal is an individual, a partnership, an association of persons, a private or public company, that carries out specific obligation(s) towards processing of BHEL tender or finalization or execution of BHEL's contract on behalf of the foreign supplier.

In case of yes, vendor to note the following and reply accordingly:

- i. BHEL shall deal directly with foreign vendors, wherever required, for procurement of goods. However, if the foreign principal desires to avail of the services of an Indian agent, then the foreign principal should ensure compliance to regulatory guidelines - which require mandatory submission of an Agency Agreement.
- ii. It shall be incumbent on the Indian agent and the foreign principal to adhere to the relevant guidelines of Government of India, issued from time to time.
- iii. The Agency Agreement should specify the precise relationship between the foreign OEM / foreign principal and their Indian agent and their mutual interest in the business. All services to be rendered by agent/ associate, whether of general nature or in relation to the particular contract, must be clearly stated by the foreign supplier/ Indian agent. Any payment, which the agent or associate receives in India or abroad from the OEM, whether as commission or as a general retainer fee should be brought on record in the Agreement and be made explicit in order to ensure compliance to laws of the country.
- iv. Any agency commission to be paid by BHEL to the Indian agent shall be in Indian currency only.
- v. Tax deduction at source is applicable to the agency commission paid to the Indian agent as per the prevailing rules.
- vi. In the absence of any agency agreement, BHEL shall not deal with any Indian agent (authorized representatives / associate / consultant, or by whatever name called) and shall deal directly with the foreign principal only for all correspondence and business purposes.
- vii. The "Guidelines for Indian Agents of Foreign Suppliers" enclosed at annexure - 'A' shall apply in all such cases.

- viii. The supply and execution of the Purchase Order (including indigenous supplies/ service) shall be in the scope of the OEM/ foreign principal. The OEM/ foreign principal should submit their offer inclusive of all indigenous supplies/ services and evaluation will be based on 'total cost to BHEL'. In case OEM/ foreign principal recommends placement of order(s) towards indigenous portion of supplies/ services on Indian supplier(s)/ agent on their behalf, the credentials/ capacity/ capability of the Indian supplier(s)/ agent to make the supplies/ services shall be checked by BHEL as per the extant guidelines of Supplier Evaluation, Approval & Review Procedure (SEARP), before opening of price bids. In this regard, details may be checked as per Annexure-B (copy enclosed). It will be the responsibility of the OEM/ foreign principal to get acquainted with the evaluation requirements of Indian supplier/ agent as per SEARP available on www.bhel.com.

The responsibility for successful execution of the contract (including indigenous supplies/ services) lies with the OEM/ foreign principal. All bank guarantees to this effect shall be in the scope of the OEM/ foreign principal.

---X---

Vendor's Signature with Seal

Guidelines for Indian Agents of Foreign Suppliers

- 1.0 There shall be compulsory registration of agents for all Global (Open) Tender and Limited Tender. An agent who is not registered with BHEL shall apply for registration in the registration form in line with SEARP.
- 1.1 Registered agents will file an authenticated Photostat copy duly attested by a Notary Public/Original certificate of the Principal confirming the agency agreement and giving the status being enjoyed by the agent and the commission/ remuneration/ salary/ retainership being paid by the principal to the agent before the placement of order by BHEL.
- 1.2 Wherever the Indian representatives have communicated on behalf of their principals and the foreign parties have stated that they are not paying any commission to the Indian agents, and the Indian representative is working on the basis of salary or as retainer, a written declaration to this effect should be submitted by the party (i.e. Principal) before finalizing the order.
- 2.0 **Disclosure of particulars of agents/ representatives in India, if any.**
- 2.1 Tenderers of Foreign nationality shall furnish the following details in their offers:
 - 2.1.1 The Bidder(s)/ Contractor(s) of foreign origin shall disclose the name and address of the agents/ representatives in India if any and the extent of authorization and authority given to commit the Principals. In case the agent/ representative be a foreign Company, it shall be confirmed whether it is existing Company and details of the same shall be furnished.
 - 2.1.2 The amount of commission/ remuneration included in the quoted price(s) for such agents/ representatives in India.
 - 2.1.3 Confirmation of the Tenderer that the commission/ remuneration, if any, payable to his agents/ representatives in India, may be paid by BHEL in Indian Rupees only.
- 2.2 Tenderers of Indian Nationality shall furnish the following details in their offers:
 - 2.2.1 The Bidder(s)/ Contractor(s) of Indian Nationality shall furnish the name and address of the foreign principals, if any, indicating their nationality as well as their status, i.e. whether manufacturer or agents of manufacturer holding the Letter of Authority of the Principal specifically authorizing the agent to make an offer in India in response to tender either directly or through the agents/ representatives.
 - 2.2.2 The amount of commission/ remuneration included in the price (s) quoted by the Tenderer for himself.
 - 2.2.3 Confirmation of the foreign principals of the Tenderer that the commission/ remuneration, if any, reserved for the Tenderer in the quoted price(s), may be paid by BHEL in India in equivalent Indian Rupees on satisfactory completion of the Project or supplies of Stores and Spares in case of operation items.
- 2.3 In either case, in the event of contract materializing, the terms of payment will provide for payment of the commission/ remuneration, if any payable to the agents/ representatives in India in Indian Rupees on expiry of 90 days after the discharge of the obligations under the contract.
- 2.4 Failure to furnish correct and detailed information as called for in paragraph 2.0 above will render the concerned tender liable to rejection or in the event of a contract materializing, the same liable to termination by BHEL. Besides this there would be a penalty of banning business dealings with BHEL or damage or payment of a named sum.

Disclaimer Certificate For Deemed Export Benefits

I, (Name & Designation)on behalf of M/s. (Name and address of the supplier) hereby certify that we have supplied the following goods to M/s..... (Name and address of the recipient):

S.No.	Inv. No. & date	Description of goods	Unit	Qty.	Value

1. We are the manufacturer exporters/suppliers and are registered/not registered with Central Excise and have not availed and will not avail CENVAT facility in respect of the input/components used in aforesaid supplies. We have also not availed and will not avail rebate on the inputs/components used in aforesaid supplies.

OR

We are the suppliers and our supporting manufacturer(s) is/are registered/not registered with Central Excise and have not availed and will not avail CENVAT facility in respect of the inputs/components used in aforesaid supplies.

2. We also certify that we have not been issued any Advance Authorization/Duty Free Import Authorization in respect of the aforesaid supplied goods and have not availed any benefit thereon.

3. We further state that we have not drawn nor will draw any benefit for deemed export and we have no objection if M/s..... (Name and address of the recipient) draws the deemed export benefits on the supplies mentioned above. (Required to be given in case benefits are claimed by recipient of goods).

OR

We have not given disclaimer certificate to M/s..... (Name and address of the recipient) and will not give disclaimer certificate, in future, in respect of these supplies for claiming deemed export benefits (Required to be given in case benefits are claimed by DTA suppliers).



ಭಾರತ್ ಹವಿ ಎಲೆಕ್ಟ್ರಿಕಲ್ಸ್ ಲಿಮಿಟೆಡ್
भारत हेवी इलेक्ट्रिकल्स लिमिटेड
Bharat Heavy Electricals Ltd.,
(A Government of India undertaking)
Electronics Division

Page 1 of 3

CE: PR: 003- Rev 01

PB 2606 , Mysore Road Bangalore , 560026 INDIA

SPECIAL COMMERCIAL CONDITIONS OF CONTRACT

Reference is brought to BHEL's Instructions to Bidders (Document Ref: CE: PR: 001- Rev 01) and General Commercial Conditions for Contract (Document Ref: CE: PR: 002- Rev 01).

These two documents along with Special Conditions of Contract annexed to this RFQ will form an integral part of the contract as and when the RFQ culminates into a Purchase Order / Contract.

RFQ No : SAM0000228
RFQ Date : 23/06/18 Due Date:25/07/18
Customer/Project : NORTH CHENNAI TPP-1x800MW STAGE-III, PROJECT
Item Description : ELECTRICAL C&I , Lab Item

TYPE OF BID: ~~SINGLE PART BID- / TWO PART BID-~~ **THREE PART BID**

Purchase Executives: Clarifications with regard to the tender shall be addressed to purchase officers whose e-mail IDs are given below: umapathi@bhel.in or sapna@bhel.in

Splitting of tendered quantity to MSE vendors: The tendered quantity will /will not be split to MSE vendor/s subject to submission of relevant documents by vendors. Refer clause I of Instructions to Bidders for conditions applicable and for information on documents to be submitted.

Destination: Items are to be directly despatched to BHEL's Site Office or Stores located in **NORTH CHENNAI 1x800MW, TAMIL NADU**. Consignee details and Road Permit, if applicable, will be issued by BHEL along with Despatch Clearance.

Project Benefits:

Imported scope of supply:

- ~~a) DEEC / SEZ/EPCG/DFIA/ Physical Export contract: Eligible for "NIL" Basic Customs Duty.~~
- ~~b) Project Imports: Supply of Main analysers for both projects are eligible for Concessional Basic Customs Duty. Merit Duty is applicable on Spares of both projects.~~
- ~~c) Basic Custom duty and Cess on Basic Custom duty are reimbursable by customer.~~

Terms of Delivery:

• **Indigenous scope of supply:**

Ex-works < station of dispatch > (including Packing & Forwarding charges but excluding Taxes & Duties).

• **Imported scope of supply:**

~~F.C.A. (for air consignments) < indicate international port of dispatch > / C.I.F. (for sea consignments) < ICD, Bangalore > (including Packing, Forwarding, Handling, Ancillary charges like processing of Sight Draft/ Letter of Credit, negotiation of bank documents, Export declaration, Country of Origin etc.).~~

~~Kindly indicate the approximate weight of the total imported consignment, which is required for calculating air freight charges:~~

Under-mentioned details shall be provided against indigenous supplies and services:

- GSTIN (no.) of place of supply: _____
- HSN (Harmonized System of Nomenclature) code: _____
Applicable tax and Rate: _____ & _____
- SAC (Service Accounting Code) no.: _____
Applicable tax and Rate: _____ & _____
- GSTIN (no.) of place of supply of service: _____

I. Bidders to mandatorily provide confirmation/compliance for the under-mentioned terms:

SL NO.	TERMS	BHEL ACCEPTABLE TERM	BIDDER'S CONFIRMATION	REMARKS,if any
01	Reverse Auction	BHEL's decision for opting Reverse Auction or price-bid opening, will be intimated separately to qualified bidders after finalization of techno-commercial evaluation. In case BHEL does not resort to Reverse Auction, the price bids and price impacts (if any) shall be opened as per BHEL's standard practice. Note: Non-acceptance to participate in RA may result in non-consideration of the bid, in case BHEL decides to go for RA.	AGREE	
02	Parting of license for imported raw materials	In case of projects where Basic Custom Duty is NIL and vendor is importing any raw materials / components for the enquired item, same are eligible for Zero Customs duty. As per EXIM policy, BHEL will part the import licence with the vendors to obtain import licence by themselves and custom clear the raw materials/ components by availing zero customs duty. Hence, please furnish list of raw materials / components to be imported by you with Quantity and CIF value (for which BHEL has to share import licence). The benefit due to the above shall be passed on to BHEL and confirmed in the quotation. If there are no imported raw materials/components, same shall be confirmed in the offer.	AGREE CIF value Yes, benefit passed on to BHEL in the priced quotation. (or) We confirm that there are no imported components	
03	Delivery Period	Delivery for all items shall be within 10 weeks from the date of issue of approved documents or manufacturing clearance by BHEL, whichever is later. Delay in contractual delivery will attract Penalty as per GCC Clause no.:04.b.	AGREE weeks	
04	Terms of Payment at the time of material supply	Refer Clause "F" of Instructions to Bidder for BHEL standard Payment terms and loading factors applicable for non-compliance against payment terms: Indigenous Scope : a) Supply with Erection & Commissioning b) Supply with Erection Supervision & Commissioning c) Supply only Imported Scope : d) Supply with Erection & Commissioning e) Supply with Erection Supervision & Commissioning f) Supply only High Sea sales : g) Supply with Erection & Commissioning h) Supply with Erection Supervision & Commissioning i) Supply only Spares & Consumables: e) and/or f)/i) depending upon the scope	AGREE	

II. Bidder to note that Deviations shall not be permitted for the below mentioned terms and are deemed to be complied. In case of non-compliance/deviation, offer shall be liable for rejection:

- (1) **Submission of documents post PO viz., drawings /data sheet etc. as indicated in Cl: 04 of GCC:** Within 03 weeks from the date of receipt of Purchase Order. Delay in submission of complete set of specified documents in NIT, will attract Penalty as per GCC Clause no.:04.a.
- (2) **Validity:** The offer will be valid for a period of 120 days from the date of part-I bid opening and in case of Negotiation/ Counter-offer/Reverse Auction, price validity will apply afresh for a period of 60 days from the date of according final price by bidder (or) up to original validity period, whichever is later.
- (3) **Warranty:** 24 months from the date of dispatch of goods or 18 months from the date of commissioning of goods, whichever is earlier.
- (4) **Performance Bank Guarantee (PBG):** PBG will be applicable for a period of 36 months from the date of dispatch of goods + claim period of 03 months, for a value equal to 10% of the basic value of the purchase order.
Refer Clause "H" of Instructions to Bidders. Also note that PBG should be in the format specified in Annexure VII of ITB and no deviation to this format will be allowed.
Note: In case PBG is not furnished, the 10% basic amount will be withheld from the supply invoice. This withheld amount will be paid either against submission of supplementary invoice & Original PBG (or) against supplementary invoice without PBG after expiry of Warranty period.
- (5) **Despatch Documents:** Complete set of despatch documents (original + 1 photocopy set) as per Purchase Order shall be forwarded to Purchase Executive/BHEL directly. Depending upon the project/customer demands, despatch documents may include one or more documents from the following: Invoice (02 sets of original), Original Lorry Receipt (L/R), Packing List, Air Way Bill (AWB)/Bill Of Lading (BOL), Copy of High Sea Sales (HSS) agreement, Country of origin certificate, Warranty Certificate, NIL Short Shipment Certificate, Original Performance Bank Guarantee (directly from issuing bank to BHEL), insurance intimation letter, POD (Proof of Delivery) on L/R.
The precise list of despatch documents needed for the project will be specified in the Purchase Order.
One set of Invoice, Packing List and L/R or AWB shall be e-mailed/faxed immediately to BHEL-EDN after despatch.
- (6) **Freight Charges (for indigenous scope of supply):** Freight charges shall be to vendor's account. Against each project, vendor to quote lump sum reasonable Freight charges along with applicable tax, in priced offer.
- (7) **Evaluation criteria for tendered item/s:**
(a) ~~Item wise evaluation of tendered item.~~
(or)
(b) Evaluation of the lowest bidder will be done on complete package basis.
- (8) ~~**Integrity Pact:** Execution of Integrity Pact is applicable for this tender (Refer clause "K" of Instructions to Bidders)~~

Details of IEM for this tender are mentioned below:

Name: _____ Address: _____ Email: _____

With this, we hereby confirm that all the terms & conditions as indicated in Instructions to Bidders (Document Ref: CE: PR: 001- Rev 01) & General Commercial Conditions for Contract (Document Ref: CE: PR: 002- Rev 01) are accepted without any deviation.

Vendor's Signature with Seal

Note B:

The above filled-in document shall be furnished as part of Techno-commercial Bid without fail.

		बि एच डी एल  A4-10	CE/416/GLAB(E)/PQC REV 00			
		PQR REQUIREMENTS FOR LAB ITEMS (ELECTRICAL)				
COPY RIGHT AND CONFIDENTIAL THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED . IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.		REVISION:00	APPROVED  K.C.RAMAKRISHNAN			
			PREPARED  K.RAJASEKAR	ISSUED 416	DATE 28/06/18	



A4-10

CE/416/GLAB(E)/PQC

REV 00

PAGE 01 OF 02

SL.NO	PROJECT	CUSTOMER
1	1X800 MW COAL BASED NORTH CHENNAI THERMAL POWER PROJECT STAGE III	M/S TANGEDCO

SECTION-A

GENERAL INSTRUCTION TO BIDDERS

COPY RIGHT AND CONFIDENTIAL
THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.

		 A4-11		CE/416/GLAB(E)/PQC REV 00 PAGE 02 OF 02
		Introduction: Bidders are required to offer Laboratory Instruments (C&I Package) as per BHEL Technical Specifications (Ref :)		
COPY RIGHT AND CONFIDENTIAL THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.		1.0 ALL REQUIRED DOCUMENTS AGAINST THIS TENDER/SPECIFICATION SHALL BE SUBMITTED IN ENGLISH ONLY. 2.0 In order to accept the Technical offers/ proposals from Bidders mentioned in BHEL Technical Specification, certain Pre-qualification criteria Requirements are to be met by Bidder. 3.0 Pre – qualification requirements (PQR) are clearly mentioned in Section-B of this Specification. Bidder to read the same carefully and submit the details required for BHEL’s acceptance. 4.0 If a Bidder does not submit Complete PQR Documents or the Documents submitted by vendor does not meet the PQR Criteria mentioned , offer of such bidders will be summarily rejected and will not be considered for Further evaluation in the tender. 5.0 Technical Bid’s of those bidders who meet the PQR Criteria shall be opened for Review and further consideration by BHEL. 6.0 i) BHEL has Provided Approved makes against each item, to be followed for the BOM items .However If a vendor in his technical bid , offers makes different from approved makes and if found technically acceptable by BHEL , such <i>makes</i> only will be forwarded to customer for approval , along with credentials (Po copies of Past supplies/ commissioning Reports(MoM)/Satisfactory performance reports) <i>all the mentioned credentials as requested by bhel has</i> to be submitted by vendor ii) If the customer does not approve the makes submitted for approval or If BHEL finds that the credentials are not submitted/not satisfactory , the item will not be acceptable and supplier has to offer any other suitable make /model from approved makes ,without any financial implication to BHEL Else the vendor’s offer will be Rejected technically . 7.0 Changes in technical specification scope/BOM , If any shall be informed to participating bidders only. 8.0 If a vendor does not quote for all the listed items, then his complete offer will be technically rejected. Please note that essence of this tender is packaging and hence all items within this project are to be offered so as to have one packaged vendor for this project/Projects.		

		 A4-11		CE/416/GLAB(E)/PQC REV 00 PAGE 02 OF 02
		9.0 Evaluation methodology: BHEL shall initially open Bidder's Part1 (PQR documents) only as per Section B (Pre-qualification Requirements) of this specification for review acceptance. Only after acceptance of PQR evaluation, BHEL shall open Bidder's Technical offer(Part2) for evaluation. 10.0 <u>Bidders are required to submit offers as detailed below:</u> aa. Documents pertaining to Pre-Qualification requirement shall be submitted/Uploaded in E-procurement system under attachment titled "PQR Documents " (Part1) bb. Technical offers/proposals (Part2) for requirements mentioned in BHEL Technical Specifications shall be submitted /uploaded in E-procurement system as attachments 11.0 If Bidder is not Registered in BHEL-EDN or any other unit of BHEL For supply of Lab equipment package ,Submit duly- filled Source Request form (SRF), which shall be downloaded by Bidder from bhel website .http://supplier.bhel.in/ and to be submitted along with offer. 12.0 Name & registered address of The Bidder with Organization chart, service team and contact details shall be submitted 13.0 Bidder shall be responsible for complete package supply, installation/commissioning and satisfactory demonstration to customer. Wherever OEM Representative to be deputed for commissioning bidder shall coordinate at his own cost and complete the work. Qualified technical persons shall only be deputed by the bidder for commissioning of the items in the package. 14.0 Whenever required during evaluation of PQR and Technical offers/bids, vendor is required to be present at BHEL Electronic Division, Bangalore, for discussions. Further in the event of order, during approval of the Vendor documents by End-users/Customers, Vendor shall accompany BHEL representative for discussions(If Required).		
COPY RIGHT AND CONFIDENTIAL THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.				



CE/416/GLAB(E)/PQC

REV 00

PAGE 01 OF 03

COPY RIGHT AND CONFIDENTIAL

THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.

SECTION-B

PRE-QUALIFICATION REQUIREMENTS

		 A4-10	CE/416/GLAB(E)/PQC
			REV 00
			PAGE 02 OF 02
		AA.Pre-Qualification Requirements (PQR) bidders for Lab instruments(Electrical) (C& I Package) as Part of offer	
COPY RIGHT AND CONFIDENTIAL THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.			1.0 Vendor should have supplied Lab instruments(Electrical) equipments to process plant/ refinery/ power plant/ nuclear plant / testing Lab. 2.0 Vendor should be in business of supplying Lab instruments(Electrical) equipments for at least last two (2) years from the date bid opening . 3.0 Minimum One no. purchase order for Lab instruments(Electrical) equipment shall be submitted which should not be more than 5 years old from date of bid opening for establishing continuity in business. 4.0 Bidder has to submit letter of undertaking stating that they will take care of service Requirements till guarantee /warranty period/ commissioning & Demonstration and handing over whichever is later 5.0 The Bidder's Average Annual financial turnover during the last 3 financial year, ending 31st March 2018 should be at least 75 lakhs INR per year. Certificate from bankers/chartered accountant/IT return in this regard should be submitted along with the offer 5.0 Bidder should have a Clean track Record , i.e the Bidder should not be under Hold or blacklist by any of the BHEL units/any Govt of india PSU/Govt of india as on bid submission date.To this effect a declaration should be given by the bidder. Note : Proof for Points 1,2,3,4 should be submitted. 6.0 Important note: - In case Bidder does not submit clause wise details mentioned in above clauses or meet the requirements of Pre-qualification requirements, Offers will be summarily Rejected and Bidder's Technical offers/proposals will not be Evaluated. Please read carefully the General instructions in Section A of this specification.

		बि एच ई एल  A4-10		CE/416/GNC/LABI REV 00 PAGE 01 OF 04						
COPY RIGHT AND CONFIDENTIAL THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.		<table><tr><th>SL.NO</th><th>PROJECT</th><th>CUSTOMER</th></tr><tr><td>1</td><td>1X800 MW COAL BASED NORTH CHENNAI THERMAL POWER PROJECT STAGE III</td><td>M/S TANGEDCO</td></tr></table>	SL.NO	PROJECT	CUSTOMER	1	1X800 MW COAL BASED NORTH CHENNAI THERMAL POWER PROJECT STAGE III	M/S TANGEDCO		
	SL.NO	PROJECT	CUSTOMER							
1	1X800 MW COAL BASED NORTH CHENNAI THERMAL POWER PROJECT STAGE III	M/S TANGEDCO								
		LABORATORY INSTRUMENTS ELECTRICAL (C&I PACKAGE)								
		REVISION:00	APPROVED  K.C.RAMAKRISHNAN							
			PREPARED  K.RAJASEKAR	ISSUED 416	02.06.2018					

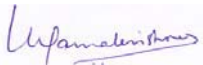
THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.

INDEX

S.No	Description	Reference
1.	SCOPE OF SUPPLY	CE/416/GNC/LABI/SOS Rev 00, Pages 04
2.	TECHNICAL SPECIFICATIONS	CE/416/ GNC /LABI/TS Rev 00, Pages 12

		 A4-10		CE/416/GNC/LABI/SOS REV 00 PAGE 03 OF 04
COPY RIGHT AND CONFIDENTIAL THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED . IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.		<u>SCOPE OF SUPPLY</u> The scope of supply consists of LABORATORY INSTRUMENTS (C&I) Package for the project mentioned Although immense care has been taken to cover all the items applicable for the project, it is possible that some items may have been missed (which needs to be added) or some items have been already supplied which are not to be supplied now for these projects. Then in either case, unpriced impact (technical) and price impact will be taken from participating vendors. But please note that if a vendor has not participated in this RFQ and if the impact is applicable due to change in quantities or due to acceptance of deviations, non-participating vendor will not be sent intimation (under this RFQ) as the changes are very, very minimal keeping the non-participating vendor still debarred under this packaged RFQ. Hence, all vendors should actively participate offering all the items. If a vendor does not quote for all the listed items, then his complete offer will be technically rejected. Please note that essence of this tender is packaging and hence all items within this project are to be offered so as to have one packaged vendor for this project. Please note that if any item requires battery, same should be rechargeable type of same item make or equivalent good make. Then the corresponding charger is also to be provided. Also, please note that computer interface is to be provided with relevant pre-fabricated cable of 2 or 3 meters length for connectivity to computer, Current Probe and High Voltage Probe as and where applicable for the individual instrument. If any application software is required due to this, same is also to be provided as and where applicable for that particular instrument. If any deviations are accepted by bhel During evaluation stage and subsequently not accepted by end customer during datasheet submission stage ,then vendor has to replace the model without any financial implication to BHEL. Project wise unit rates are to be offered taking care of applicable BOM for individual project since the items are being enquired as a package for individual project. Subsequently, after ordering, unit rates of each and every BOM item of project is to be provided to take care of any addition/deletion during detailed engineering stage. Erection supervision and commissioning is also to be offered with lump sum rates each project wise. Please note that for any item offered by vendor BHEL reserves the Right to ask the vendor, any or all of these credentials (Po copies of Past supplies/ commissioning Reports(MoM)).If the credentials are not submitted/not satisfactory , the item will not be acceptable and supplier has to offer any other suitable make /model without any impact to BHEL. All the electronic M&C items shall be microprocessor based and shall have the data logging facility for keeping calibration/maintenance records with proper communication facility for downloading these data on the Lab PC. Wherever such facility is available in the Equipment offered The vendor if required has to visit BHEL-EDN for technical clarifications during technical evaluation After order and datasheet submission to customer/consultant vendor has to visit Customer /consultant (if required) with BHEL for resolving any technical clarifications required by them. The calibration standards of all M&C equipments furnished under this sub-section shall be traceable to National Bureau of Standards, USA or NPL, India or to the applicable standards existing in the country where the equipment is manufactured.Dust proof carrying case and Rechargeable battery along with external charger shall be provided For the project site under this RFQ vendor has to offer following option:- 1.) Despatch of items as per standard package as done normally. ERECTION SUPERVISION & COMMISSIONING: Please note that Erection Supervision & Commissioning is to be offered each project wise and same will be considered while evaluating lowest commercial tender. The commissioning will involve demonstrating the healthiness and working of all the items within the project to the satisfaction of BHEL site office/end-user. This will necessitate maximum of 3-5 days stay at project site.		
		3		

		 A4-10	CE/416/GNC/LABI/SOS																
			REV 00																
			PAGE 04 OF 04																
TECHNICAL DOCUMENTS TO BE SUBMITTED ALONG WITH OFFER(MANDATORY): 1.) Technical bid should be having Desc, Qty, make, Model, Strictly as per the Template format given below (In Pdf and excel) 2.) Catalogues of all the items in soft copy																			
DOCUMENTS TO BE SUBMITTED AFTER PLACEMENT OF ORDER: a. Datasheets along with catalogs for each and every item properly indexed. b. Mounting details including necessary accessories (If applicable) c. Recommendations (if any) for installation/ storage etc d. Spare part list e. Consumable list f. Training details g. O&M Manual (<i>After datasheet approval</i>) h. Any other scheme, data, drawing, document, etc required to establish product quality and completeness of supply. The above documentation shall be each project wise with around 8 copies or On as required for each project on an average. Apart from hard copies, soft copy in the form of CD/Pen drive should also be provided for each project. TEMPLATE To be followed for technical bid (Example) : <table border="1" data-bbox="316 861 1412 976"> <thead> <tr> <th>Sino</th> <th>Desc</th> <th>Qty</th> <th>make</th> <th>model</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Soldering Station</td> <td>2</td> <td>HAKKO</td> <td>FR-810 Accessories : handpiece holder, FP pick-up (with pick-up wire SS), heat resistant pad, power cord,</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>					Sino	Desc	Qty	make	model	1	Soldering Station	2	HAKKO	FR-810 Accessories : handpiece holder, FP pick-up (with pick-up wire SS), heat resistant pad, power cord,					
Sino	Desc	Qty	make	model															
1	Soldering Station	2	HAKKO	FR-810 Accessories : handpiece holder, FP pick-up (with pick-up wire SS), heat resistant pad, power cord,															
COPY RIGHT AND CONFIDENTIAL THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED . IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.																			

		 A4-10	CE/416/GNC/LABI/TS								
			REV 00								
			<table border="1"> <tr> <th>SL.NO</th> <th>PROJECT</th> <th>CUSTOMER</th> </tr> <tr> <td>1</td> <td>1X800 MW COAL BASED NORTH CHENNAI THERMAL POWER PROJECT STAGE III</td> <td>M/S TANGEDCO</td> </tr> </table>			SL.NO	PROJECT	CUSTOMER	1	1X800 MW COAL BASED NORTH CHENNAI THERMAL POWER PROJECT STAGE III	M/S TANGEDCO
			SL.NO	PROJECT	CUSTOMER						
1	1X800 MW COAL BASED NORTH CHENNAI THERMAL POWER PROJECT STAGE III	M/S TANGEDCO									
TECHNICAL SPECIFICATIONS FOR LABORATORY INSTRUMENTS ELECTRICAL (C&I PACKAGE) <i>Note : Package is Common for total plant</i>											
		REVISION:00	APPROVED  K.C.RAMAKRISHNAN								
			PREPARED  K.RAJASEKAR	ISSUED 416	DATE 02.06.2018						



A4-10

CE/416/GNC/LABI/TS

REV 00

BILL OF MATERIALS

SLNO	Description	Unit	Qty
1.	Electronic Test Bench	No	1
2.	Computer aided Calibration system with one no. OWS, Printer and Complete Software	Set	1
3.	Portable Digital Multimeter (4 ½ digit)	No	15
4.	(Digital Multimeter (Table Mounting Type) (5-1/2 Digit -1 No and 7 1/2 Digit-1 No)		
	a) 5 1/2 digit	No	2
	b) 7 1/2 digit	No	2
5.	RCL meter	No	1
6.	In Circuit Tester	No	1
7.	Function Generator	No	1
8.	Digital Oscilloscope	No	1
9.	Tachometer	No	2
10.	Soldering iron (1 No of each type) 10 Watts25 Watts40 Watts	No	3
11.	Solder Sucker	No	2
12.	Soldering Desoldering station	No	2
13.	Potentiometer/Rheostat 2A : 2Nos (5000Ω) 5A : 2 No (47Ω) 2A : 2 No (470 Ω) 10A : 2 No(470 Ω) 2A : 2 No(2200 Ω)	set	1
14.	AC Thermometry Bridge	No	1
15.	Stop Watch	No	2
16.	mV Calibrator (3 No portable , 1 No Table mounted)		
	a.Portable	No	3
	b.table mounted	No	1
17.	mA Calibrator (6 No Portable , 2 No table mounted)		
	a) Portable	No	6
	b) table mounted	No	2
18.	Thermocouple calibrator (2 No-Portable), (2 No Table mounted)		
	a) Portable	No	2
	b) table mounted	No	2
19.	RTD Calibrator (1 No portable , 1 No Table mounted)		
	a) Portable	No	1
	b) table mounted	No	1
20.	Multi Function Calibrator	No	2

Note : Only Customer approved makes as per attached list is acceptable. Refer Bom with approved makes appearing in the specification

COPY RIGHT AND CONFIDENTIAL
THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED . IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.



A4-10

CE/416/GNC/LABI/TS

REV 00

BILL OF MATERIALS

21.	Digital Insulation Tester	No	2
22.	Sound Level Monitor	No	2
23.	Portable Digital/Analogue Vibration Meter (Digital type-2 , Analog type-1 No)		
	a) Digital type	No	3
	b) Analog type	No	2
24.	VIBRATION/ SHOCK PULSE ANALYSER cum Data Collector cum Balancer	No	1
25.	Decade Resistance Box (3 Nos-Analog type, 3 Nos Digital type)		
	a) Analog type	No	3
	b) Digital Type	No	3
26.	LAN/ Coaxial Cable Meter/ Tester	No	2
27.	EARTH/GROUND RESISTANCE TESTER	No	2
28.	Fiber Optic Testing Tool Set	No	2
29.	Tong Tester	No	2
30.	Stroboscope	No	1
31.	Auto Transformer (Single Phase-2 No, Three phase-2 No)		
	a. single phase	No	2
	b. polyphase	No	2
32.	Test Temp Detector – Test RTD	No	2
33.	Overhead projection Board (Interactive White Board)	No	2
34.	Projector with white board.	No	1
35.	Portable Ph Calibrator/Simulator	No	1
36.	Logic Probe	set	1
37.	Marker Printers (1 No of each type)	No	1
38.	DC Regulated Power supply	No	4
39.	Frequency counter	No	1
40.	Portable conductivity Meter	No	1
41.	Vibration Pick Up tester	No	1
42.	stabilised power supply	No	3
43.	Continuity Tester	No	9
44.	Optical time Domain reflectometer	Set	2
45.	Decade capacitance Box	No	1
46.	Decade Inductance Box	No	1
47.	LAB WORKSTATION , A3/A4 B/W DIGITAL LASER PRINTER CUM COPIER AND LAPTOP -1 NO Each	set	1

Note : Only Customer approved makes as per attached list is acceptable. Refer Bom with aproved makes appearing in the specification

COPY RIGHT AND CONFIDENTIAL
THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED
. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF
THE COMPANY.



CHAPTER-15

CONTROL INSTRUMENTATION LABORATORY & TESTING EQUIPMENT

2.3.15 C&I LAB and Testing Equipment

2.3.15.1 General Requirements

This section sets forth the technical information required for the design, furnishing and construction of an instrumentation Lab shop, complete with tools and test equipment required to maintain the instruments and control devices for the power plant.

Equipments, tools and instruments

- 1) Testing instrument/devices offered shall be proven type and shall incorporate latest design.
- 2) The workmanship and design shall be in accordance with the best engineering practice and shall be such, as have proved to be suitable for the intended purpose and shall offer satisfactory performance even in the worst environmental conditions.
- 3) Testing instruments/devices shall be furnished with all necessary accessories whether specifically indicated herein or not.
- 4) All instruments offered, shall conform to the relevant IS or international standards.
- 5) Accuracy of the calibration instruments should be traceable to National or international standards indicating date of calibration and due date of calibration. Calibration and traceability certificate shall be provided with the Lab instruments.
- 6) The various instruments/devices, small tools, accessories etc. shall be furnished (in applicable cases) with suitable and durable boxes of convenient size, complete with necessary packing etc. in order to have safe storage when not in use.
- 7) Measuring/testing instruments, along with allied accessories shall be suitable for continuous operation (both indoor and outdoor installations as applicable).
- 8) The various equipments / devices, tools, accessories etc., shall be furnished (in applicable cases) with suitable and durable boxes of convenient size, complete with necessary packing etc. in order to have safe storage when not in use.
- 9) The Bidder shall supply testing instruments/ devices, specified hereinafter, for meeting the requirement of the power plant. The Bidder shall be responsible for proper functioning of supplied items, to check and make any necessary additions/tools as required for proper



EPC TENDER SPECIFICATION FOR BTG PACKAGE

maintenance and testing of the installed instruments and controls. The Bidder shall also be responsible for erection and commissioning the test equipment where applicable.

- 10) It is obligatory to the Bidder to furnish a complete list of spare parts for these testing/calibrating, instruments/devices. The Bidder shall render guarantee for easy availability of all the spare parts required, especially for the components, which are prone to failure.
- 11) The Bidder shall repair the defective instruments/devices free of cost within the guaranteed period or replace the same if required.
- 12) The Bidder shall submit with the proposal a full list of testing/maintenance equipment/tools offered. A full description and detailed specification of the items offered shall also be submitted by the Bidder for owners approval prior to purchase. Photographs, catalogues, drawings as required shall be submitted with the proposal to provide necessary information pertaining to the items offered. Information for the items offered shall include (as applicable) but not limited to the following:
 - a) Working Principle
 - b) Power supply and other utility details
 - c) Dimensional details
 - d) Mounting details including necessary accessories
 - e) Recommendations (if any) for installation, storage, etc.
 - f) Accuracy (wherever applicable).
 - g) Calibration Certificates for each equipment having National/International Trace ability.
 - h) Make & Model

The maintenance and calibration equipment specified in this section shall be in addition to similar portable equipment required by the Bidder for installation and initial calibration of instrumentation and control equipment furnished by these specifications. The Bidder shall hand over to the Owner all equipment specified in this sub- section immediately after receiving the equipment at the job site. Use of these equipments by the Bidder shall not be permitted without the Owner's consent. Owner has the rights to choose/select/decide the model.

The equipment specified in this section shall be in addition to any special test stands which shall be recommended and supplied by the Bidder for use in calibrating electronic components of the instrumentation and control systems to be furnished.

2.3.15.2 Calibration Standards

The calibration standards shall be traceable to the National Bureau of Standards of the United States of America, comparable Indian Standards, or to applicable standards existing in the country where the equipment is manufactured and tested. The Bidder shall elaborate in the proposal the standards followed for the equipment manufacturing and testing.



1X800 MW COAL BASED NORTH CHENNAI THERMAL
POWER PROJECT STAGE III



EPC TENDER SPECIFICATION FOR BTG PACKAGE

~~Five (3) nos. teak wooden work tables with thick laminated top of size 1x2 meters, Eight (8) nos. high adjustable wheeled swivel chairs, Five (5) nos. vertical cabinets 1000 x 480 x 2000 mm made of sheet steel (Sheet thickness of 18 gauge) and equipped with safety locks, Five (5) nos. open shelf 1000x200x2000 with partitions made of steel shall be provided in addition to Electronic & Pneumatic Lab test bench.~~

Microprocessor based lab instruments shall be offered wherever applicable. All the microprocessor based maintenance and calibration units should also have provision for data logging facility for keeping calibration/maintenance record with proper communication facility to down load these data on the lab work stations.

The Bidder shall supply testing instruments/ devices, specified hereinafter, for meeting the requirement of the power plant. The Bidder shall be responsible for proper functioning of supplied



EPC TENDER SPECIFICATION FOR BTG PACKAGE

items, to check and make any necessary additions/tools as required for proper maintenance and testing of the installed instruments and controls. The Bidder shall also be responsible for erection and commissioning the test equipment where applicable.

It is obligatory to the Bidder to provide mandatory spare parts for these testing/calibrating, instruments/devices as approved by Owner. The Bidder shall render guarantee for easy availability of all the spare parts required,

All the calibration instruments shall be provided with RS232C port for Lab WORK STATIONS & laptop interface with their own interfacing cables & software.

All the portable type lab instruments shall be provided with own rechargeable battery & charger.

~~2.3.15.3 Instrument Work Shop~~

~~The scope shall include the arrangement and installation of instrument workshop equipment supply and connection of all electric power supply including air distribution system.~~

SLNO:1

~~2.3.15.4 Electronic Test Bench~~

Self-contained test bench made of anodised aluminium for testing and repair of electronic instruments and gadgets shall be furnished. The test bench shall be of modular design, enabling easy change of arrangement/ layout as and when required. This shall include necessary isolating switches, power supply switches, holding brackets, etc. Test bench shall be furnished with thick laminated top. Desk with drawers shall be included.

The test bench shall include necessary power modules from reputed manufacturers to feed the following sockets mounted on the test bench (Voltage rating is tentative and shall be matched to supply requirements of Bidder's range of products):

S.No.	Items	Qty
1	3 pin socket, 240VAC, 4A low-voltage output, earth leakage circuit breaker etc. for whole workstation	1
2	240V AC $\pm 0.5\%$, 1 phase, 50 Hz, 3 kVA supply socket, circuit breaker, as an Isolated supply module	6
3	110V AC, 10 Amp. 50Hz supply socket & 0-260V AC, 1ph, 50Hz (Variat), 10amps with Digital meter for current and voltage	1 no. each
4	Voltage stabilizer 240(+ / -0.5%) VAC, 1ph, 50Hz, 3KVA	4
5	+ / -48V DC, 3A with Digital meter for current and voltage	2



1X800 MW COAL BASED NORTH CHENNAI THERMAL
POWER PROJECT STAGE III



EPC TENDER SPECIFICATION FOR BTG PACKAGE

S.No.	Items	Qty
6	+/-24V DC, 6A with Digital meter for current and voltage	2
7	+/-12V DC, 10A with Digital meter for current and voltage	2
8	+/- 5V DC, 20A with Digital meter for current and voltage	2
9	0-220V DC (variable) stabilized output 1 Amp No load to full load regulation	1
10	Plant UPS power point/sockets.	2

The test bench shall include socket holders where the electronic gadgets under test may be plugged. The front equipment shall include multipoint connectors and test jacks for interconnection. There shall be connection between the connector and holder in which device under test shall be plugged in. All power points must be labelled. Electronic test bench should have instrument earth tapping points. 2 nos. Air guns shall be provided for cleaning the instrument in test bench tools.

~~Power cable with necessary sizing shall be supplied & laid by bidder from UPS ACDB1 and UPS ACDB2 to C&I lab at a centralized location in C&I lab and~~ from there the required distribution board with UPS feeders including 20 % spare feeders shall be provided for distribution purpose inside the

3 phase, 415 VAC power supply with proper distribution board for electric actuator motor testing should be available in the lab by bidder. Also three (3) nos. of tables shall be offered by bidder with required regulated 24 VDC power supply socket for testing of transmitters on these tables.

~~Complete cables required for power supply in lab shall be in bidder scope of supply. All external power supply points shall be located at a centralised location in lab room.~~ The standard high accuracy resistors shall be included to load and measure the current output of devices. Necessary control devices for voltage and current adjustments/ control switches for power supplies to feeders, isolation etc., shall be included. All electric circuits shall be protected against overload by fuses, whose holders are located on front of the panel. All electrical circuits and metal structures shall be properly grounded.

The following facilities shall also be provided on the electronic test bench:

S.No.	Features	Essential / Minimum Requirements
1	One DC voltage stabilizer(0 to 220V, 1 Amp)	Regulation + / -0.02% for0-100% load variation.
2	One AC voltage stabilizer (input 240V AC nominal, output 240V AC + / -0.5%)	Regulation + / -0.5% for0- 100% load variation
3	One no. 41 / 2 digits digital Multimeter for display of voltage, current, resistance and having at least 24 measuring ranges	Accuracy 0.1 + / - 1 digit
4	Standard Current Source	0-55mA



Each workbench suitable for Electronic Work and pneumatic work with wood top approximate size 75 x 300 cm. with side drawers (fitted with lock) and board on back of the bench top with electric fittings. Each workbench shall be fitted with all essential tools as described under for electronic workbench and for pneumatic work bench. Each bench shall also be fitted with electrical fittings - sockets and colour coded banana jacks for each kind of voltage used in the power station control system and one 20-watt fluorescent lamp at each table.

. One no. 2 sided Folding Aluminium ladder (height 180 cm or better) for maintenance and mounting bracket for ladder shall be provided by bidder in each C&I lab room.

SLNO:2

Computer aided Calibration system with one no. OWS, Printer and Complete Software :

Computer Aided Calibration system offered, shall meet the demands of high precision transfer / secondary standards for automatic testing & calibration of temperature, pressure & electrical parameters in quick time and for issuance of simple, error free, reliable, fully traceable calibration certificates conforming to ISO standards / Protocol. Complete lab softwares with life time validity shall be provided by bidder, which shall be loaded on Lab operating station and Lab laptop parallelly. Any lab software mentioned or not shall be provided by bidder. Any software required for any lab instrument/equipment shall also be provided by bidder.

Computer Aided Calibration system shall have also the following facilities: -

1) Automatic Testing and Calibration:

i) Pressure instruments like pneumatic/hydraulic pressure/ differential pressure vacuum gauges/indicators / transmitters/ switches/controllers, electro-pneumatic instruments P/I, I/P converters.

ii) Pressure/differential/temperature/flow transmitters current/pH converters.

iii) Analog instruments, such as indicators for pressure, current, voltage etc.

iv) Digital panel indicators with additional port for DC current measurement.

2) Automatic testing and calibration of all types of temperature measuring instruments including temperature indicators/ recorders/controllers, thermo switches, RTD and Thermocouples of all international standards (range from -20 Deg.C to 1200 Deg.C).

3) An automatic temperature calibration system for simultaneous calibration of multiple temperature sensors.

4) Automatic calibration and system documentation through Lab Operating station and Laptop offered with compatible calibration software.

5) Measuring/testing instruments, along with allied accessories shall be suitable for continuous operation (both indoor and outdoor installations as applicable).



SLNO:3 ii) Portable Digital Multimeters

Portable digital multimeters, with high voltage grade leads/probes and suitable casing including carrying strap are envisaged. Digital multimeters shall have 4 1/2 digits read out indicator with automatic decimal point and polarity indicator. Indication shall be in seven segment LCD display. Meters shall be complete with accessories for high voltage, DC current, temperature, and Capacitance and frequency measurements.

Instruments offered, shall have built in overload protection feature. These shall have high resolution and low response time. For AC signals (True RMS) digital multimeters shall have good fidelity over a large range of frequencies. Signals and ranges required to be measured by the meter are furnished in a tabular form below :-

S.No.	Signal type	Range	Accuracy
1	DC voltage	100 mV	+ / - 0.3% +1 digit or better
		1 V	-do-
		10 V	-do-
		100 V	-do-
		500 V	-do-
		1000V	-do-
2	AC voltage	Same as DC voltage	+ / -0.5% of reading + 2 Digits or better
3	Direct Current	200 micro amp.	+ / -0.75 % of reading + 2 Digits or better
		1 mA	-do-
		10 mA	-do-
		100 mA	-do-



EPC TENDER SPECIFICATION FOR BTG PACKAGE

S.No.	Signal type	Range	Accuracy
		1 A	-do-
		10A	-do-
4	Alternating Current	Same as Direct Current	+ / -1.0% of reading or better
5	Resistance	0.1 K ohm	+ / - 0.5% of reading + 2 digit
		1 K ohm	-do-
		10 K ohm	-do-
		100 K ohm	-do-
		1 M ohm	-do-
		10 M ohm	-do-
6	Input resistance	10 Meg ohms	
7	Ambient temp.	0-50 deg.C	
8	Ambient Temp. error from 0-50 deg.C	+ 0.1% of reading	
9	One red indication lamp shall indicate the overload.		
10	Handheld		
11	IEC CAT III 600V Safety rating.		
12	Drop protected to 1 meter		
13	Easy access battery door to change the battery without breaking the calibration seal.		
14	Accessories	Test leads per multimeters, One set of spare test leads per multimeters, Rechargeable Alkaline battery per mutimeter Software & hardware for interfacing per multimeter.	

SLNO:4 Digital Multimeter (Table Mounting Type)

High standard multimeters are envisaged for the instrument shop. The multimeters shall offer simplicity in operation. The multimeters shall have a built in automatic overload protection. The meter shall offer ease and simplicity in operation to render the instrument in use after overload protection being operated. The instrument shall offer a good fidelity over a large range of frequency. Temperature compensation shall be built in.

The components inside the instrument shall be impervious to moisture. The multimeters shall be complete with suitable cover. Each multimeter shall include two (2) high voltage grade loads which shall be interchangeable. Spare loads/probes with clips shall be supplied with multimeter. Voltage multiplier, high and low resistance range extension unit with suitable replaceable battery may be offered. Ranges and accuracy of the multimeters shall be as per the table below:-

- 1) For 7 and 1 / 2 digit multimeters

S. No.	Signal type	Ranges	Accuracy
1.	DC voltage	3 mV to 10KV	+ / - 0.002%



1X800 MW COAL BASED NORTH CHENNAI THERMAL
POWER PROJECT STAGE III



EPC TENDER SPECIFICATION FOR BTG PACKAGE

2.	AC voltage	3 mV to 3 KV	+ / - 0.08%
3.	Alternating current	3 Micro amps to 30 Amps	+ / - 0.2%
4.	Direct current	-do-	+ / - 0.01%
5	Resistance	30 m Ohms to 1 G ohms	+ / - 0.003%

2) For 5 and 1 / 2 digit multimeters

S. No.	Signal type	Ranges	Accuracy
1.	DC voltage	100mV to 1000V	+ / - 0.025%
2.	AC voltage	100 mV to 750 V	+ / - 0.025%
3.	Alternating current	1 mA to 10 A	+ / -0.2%
4.	Direct current	-do-	+ / -0.01%
5	Resistance	100 Ohms to 100 M ohms	+ / -0.003%

3) Other functions:

- a) Power supply : 240V single phase
- b) Display : 5 ½ digit, 7 ½ digit
- c) Resolution : 10 Micro Volts
- d) Auto/Manual ranging facility.
- e) Meters shall be complete with accessories for high voltage, DC current, temperature, Capacitance and frequency measurements.

4) Special features:

- a) Self test Mode
- b) Diode/Zener Test
- c) Max/Min functions
- d) Continuity Testing
- e) A.C./D.C. Coupled facility
- f) Countdown and sample beep on long filter periods
- g) Oxygen free copper input terminals

- 5) Accessories : Test leads per mutimeter One set of spare test leads per mutimeter Rechargeable Alkaline battery per multimeter. Software & hardware for interfacing per multimeter.



SLNO:5

xii) RCL Meter

The instrument shall be microprocessor based and programmable with front keyboard operation. Test frequency shall be 3 M Hz. Accuracy shall be of 0.05% . The instrument shall have a digital indication of inductance. Capacitance, resistance, impedance, phase angle, Q factor, admittance and Reactance etc. value with auto ranging facility.

S.No.	Features	Essential / Minumum Requirements
1	Resistance	10 Ohms to 10 M Ohms in seven full scale ranges with least count 10 m Ohms in 10 Ohms range.
2	Capacitance	1000 PF to 1000 micro F in seven full scale ranges with least count of 1 PF in 1000 PF range.
3	Inductance	1000 micro H to 1000 H in seven full scale ranges with least count of 1 micro H in 1000 micro H range

The final ranges shall be as decided during detailed engineering and subject to Owner's approval. RCL meter shall be supplied complete with probes, leads, clips, connectors, power supply cords, & other accessories etc.

SLNO:6

xiii) In Circuit Tester

This shall be provided for functional testing & various types of ICS used in different electronic modules. It shall also be possible to functionally test various industry standard ICs. Proven test methods, like signature I V-I trace methods shall be used. Suitable PC (as per latest trends)

software for achieving the same. The testing shall be possible both in In circuit and Out circuit modes The system shall be complete including all necessary hardware, Software, Cabling, Power packs etc.



EPC TENDER SPECIFICATION FOR BTG PACKAGE

xiv) Function Generator

SLNO:7

S.No.	Features	Essential / Minumum Requirements
1	Operational Mode	Continuous, Triggered, Gated, Burst mode
2	Frequency range	0.002 Hz 80 M Hz
3	Waveforms	Sine, Triangle, square, Negative square.
4	Amplitude	100 mV to 20 V p-p (into open circuit) 50 mV to 10 V p-p (into 50 ohms)
5	Frequency accuracy	+ / - 1 %
6	Sine wave distortion	less than 0.5%
7	Frequency stability	< 0.05% for 10 min. < 0.1% for 1 hr. < 0.5% for 24 hrs.
8	Power	110V AC / 240V AC / 24V DC

SLNO:8 **xv) Dual Beam storage type Digital Oscilloscope**

Dual beam storage type oscilloscopes with color LCD display shall be supplied for the instrument shop. It shall incorporate latest state of art in design. Low watt dissipation and light weight shall be preferred. Simple direct reading controls arranged functionally shall be there in the front of the cabinet. Positive and negative triggering circuit selection shall be done easily by a selector switch. Auto range, auto set menu, automatic wave form measurement, shall be inbuilt features. Intensity/brightness shall be controlled from the front. Oscilloscope shall have a bandwidth from DC to 200 MHz (minimum). The oscilloscope shall have a minimum sensitivity of 2 mV/div.

S.No.	Features	Essential / Minumum Requirements
Time base		
1	Sweep rate	5 nano seconds/div.
2	Raise time	3.5 nano seconds
3	Accuracy	+ / - 5% or better
4	Power supply	240V, 1 pH, 50 Hz
Horizontal Amplifier		
1	Input impedance	1 M ohms (min.)
2	Band width	DC to 200 MHz
3	Operating Station	8 x 10 cm, P31 phosphor operating station with 0.45 cm/division
4	Display modes	Coloured display with Nonstore, bistable, variable persistence, fast bistable, Fast variable persistence
5	Calibration	Rectangular wave for calibration and probe adjustment
6	Accessories	a. One trolley with one lower rack is Envisaged for Carrying the Operating Station from one point to



EPC TENDER SPECIFICATION FOR BTG PACKAGE

S.No.	Features	Essential / Minumum Requirements
Time base		
		other. b. High voltage grade, probe with suitable screening etc. c. Software & hardware for interfacing.

SLNO:9 ~~xvi)~~ Tachometer

Digital Tachometer with contact and optical measurement facility in single instrument shall be supplied. Tachometer shall have measurement unit selection facility for rotational and linear velocity measurement and the same shall also be displayed. This instrument shall be offered with contact and non-contact pickup tips.

S.No.	Features	Essential / Minumum Requirements
1	Range i) Optical Mode ii) Contact Mode iii) Linear Mode	10 to 99999 rpm 10 to 20000 rpm 1 cm/sec to 1000 m/min.
2	Accuracy	±0.01% of indicated reading for optical mode & ±0.05% of indicated reading for contact & linear mode
3	Display	5 digit LCD for measurement+ Measuring unit
4	Sampling rate	0.5/1.0 second
5	Operational Mode : - Hold - Lock	Sample
6	Operating temp.	0-50°C range
7	Power supply :	Built in 9.0 volts Rechargeable battery
8	Accessories	Carrying case, One set of spare battery with Chargers Tripod & adopter, Contact adapter, surface-speed wheel, convex and concave tips, reflective tapes, battery carrying case, etc.

SLNO:10 ~~xvii)~~ Soldering iron

S.No.	Features	Essential / Minumum Requirements
1	Use & performance	Electronic soldering iron specially engineered for long Lasting heavy duty and production line use fast heat up and quick recovery timing efficient heat transfer assure steady tip temperature and superior performance. All micro-electronics soldering application. Low current leakage and



EPC TENDER SPECIFICATION FOR BTG PACKAGE

S.No.	Features	Essential / Minumum Requirements
		infinite heat insulation of element eliminates risk and damage to transistor integrated circuit and other electronic components and assure the safety of the operator.
2	Wattage & Q ty	a) 10 Watts - 1 b) 25 Watts - 1 c) 40 W atts - 1
3	Supply voltage	240V AC , 50 Hz
4	Accessory	Soldering Rod iron

SLNO:11 ~~xviii)~~ Solder Sucker

Solder sucker shall be provided for removal of molten solder from terminal connections.

SLNO:12 ~~xi)~~ Soldering Desoldering station

The soldering! Desoldering station shall have the following features:

- Two adjustable temperature controllers with maximum setting of 430 deg C (for soldering purpose) and maximum setting of 385 deg C (for desoldering cum sucking purpose)
- Digital displays for the temperature settings and actual temperatures (A common display unit with provision for selection of settings or actual temperature may be provided.)
- Vacuum pump with analog gauge meter having range of -1 bar to 0 bar.
- All required accessories like soldering! Desoldering attachments. Soldering bits of various sizes, magnifying glass etc. shall be provided.

SLNO:13 ~~xx)~~ Potentiometer/Rheostat

Wire wound continuously variable rheostat/potentiometer shall be provided. Sliding part & brush shall be rated to withstand the current flowing. Insulation resistance shall be more than 5 M ohms at 500 V DC between the terminal and case.

Quantity :



1X800 MW COAL BASED NORTH CHENNAI THERMAL
POWER PROJECT STAGE III



EPC TENDER SPECIFICATION FOR BTG PACKAGE

xxi) AC Thermometry Bridge

SLNO:14

S.No.	Features	Essential / Minumum Requirements
1	Resolution	0.0001 °C
2	Range	- 200 to 800 °C
3	Display	7 1/2 digit
4	Sensor	To support 0.25 ohm to 1000 ohms PRT.
5	Interface	RS232, galvanically isolated with Software & hardware for interfacing.
6	Power	240V AC 50/60 Hz
7	Accessories	As required for System



1X800 MW COAL BASED NORTH CHENNAI THERMAL
POWER PROJECT STAGE III



EPC TENDER SPECIFICATION FOR BTG PACKAGE

SLNO:15

xxiv) Stop Watch

S.No.	Features	Essential / Minumum Requirements
1	Type	Handheld, non- magnetic bevelled movement with two hands
2	Resolution	1/5 seconds
3	Range	30 minutes
	Display	Analog & Digital both



SLNO:16

xxix) mV Calibrator

This instrument shall provide an accurate and reliable measure of millivolt thermocouple signals and shall generate millivolt signals for calibration of receiver type instrumentation. The instrument will contain built in electronic null detector and standard cell. Manual/automatic reference junction compensation shall be provided for thermocouple measurements. The instruments shall meet or exceed the following requirements:

S.No.	Features	Essential / Minumum Requirements
1	Input range selectable	0 10 mV DC 0 200 mV DC
2	Output range selectable	0 10 mV DC 0 200 mV DC
3	Protection	0 200 mV DC
4	Accuracy	0.05% for 100% range
5	Ambient temperature	0 50°C
6	Ambient temperature error	0.02% of span from 0 50°C

SLNO:17^{xxx)} mA Calibrator

This instrument shall provide an accurate and reliable measure of milliamp signals for use in calibrating receiver type instrumentation. The instrument shall be power by a self-contained rechargeable battery pack and shall include a battery charging circuit which operates automatically when the instrument is connected to a 240V AC supply. The instrument shall be



EPC TENDER SPECIFICATION FOR BTG PACKAGE

designed to operate from a 240V AC, 50 Hz supply with the battery pack removed. The instrument shall meet or exceed the following requirements

S.No.	Features	Essential / Minumum Requirements
1	Input range selectable	0 10 mA 0 100 mA
2	Output range selectable	0 10 mA 0 100 mA
3	Protection	100% Range
4	Accuracy	0.02% of selected span
5	Ambient temperature	0 50°C
6	Ambient temperature error	0.05% of span

xxi) Thermocouple Calibrator

SLNO:18

Thermocouple calibrator shall be capable to accept all types of thermocouples (type JK,T,E,R&S). Calibrator shall be digital LCD display and shall operate from built in battery source. This shall be capable of both measurement and calibration mode of operation. Cold junction compensation shall be built in

S.No.	Features	Essential / Minumum Requirements
1	Accuracy	Measure : 0.5deg C for K Type T/C between (-)150 to 750 deg C ; 1.0deg C for R/S Type T/C between 400 to 1750 deg C ; 0.4deg C for T Type T/C between 0 to 400 deg C ;
2	Simulation	0.4deg C for K Type T/C between 190 to 1250 deg C ; 0.4deg C for R/S Type T/C between (-)50 to 800 deg C ; 0.5deg C for T Type T/C between 150 to 400 deg C ;
3	Ambient temperature	50°C (max.)
4	Temperature effect	0.01% per degree C or better
5	Power supply	240V AC 50Hz with built in Rechargeable battery for field operation
6	Voltage protection	Equipment shall be protected against external voltage up to + 110V DC
7	Accessories	i. Carrying case ii. Connector leads iii. Extension cable iv. calibration certificate v. Battery with charger vi. Instruction manual



EPC TENDER SPECIFICATION FOR BTG PACKAGE

xxxii) RTD Calibrator

SLNO:19 RTD calibrator shall be capable to accept 2, 3 & 4 wire platinum resistance thermometers of 100 ohms and copper resistance thermometer of 53 ohms. Calibrator shall be digital LCD display and shall operate from built in battery source. This shall be capable of both measurement and calibration mode of operation.

S.No.	Features	Essential / Minumum Requirements
1	Accuracy	+/- 0.25% of full scale or +/- 0.05°C or better
2	Ambient temperature	50°C (max.)
3	Temperature effect	0.01% per degree C or better
4	Power supply	240V AC 50Hz with built in chargeable battery for field Operation
5	Voltage protection	Equipment shall be protected against external voltage up to + 110V DC
6	Accessories	i. Carrying case ii. Connector leads iii. Extension cable iv. calibration certificate v. Battery vi. Instruction manual



SLNO:20 xxxv) Multi Function Calibrator

The portable unit is intent to measure electronic transmitters, RTD's, Thermocouples and act as a source for calibration of secondary instruments and system inputs. The instrument shall be digital LCD display and shall display simultaneously both input measured value and output signal. Multi meter shall be small stream lined shape, MAKES IT EASY TO CARRY. It shall be rugged, reliable design stand up to field use. It will be easy to read measure/source screen and view input and output simultaneously.

Data entry shall be through numeric entry function keys. Instrument shall have built in diagnostic and auto calibration facilities & shall also be capable of measuring voltage, current, thermocouples, RTD's & frequency and stimulation of corresponding primaries including two wire transmitters.

S.No.	Features	Essential / Minumum Requirements
1	Accuracy	+/- 0.025% typical
2	Thermocouple	Type J,K,T,E,R&S
3	RTD	Pt-100 Ohms
4	Volts	0-10V, Resolution 0.2 mV
5	Millivolts	-10-120 mV, Resolution 2 Microvolts



1X800 MW COAL BASED NORTH CHENNAI THERMAL
POWER PROJECT STAGE III



EPC TENDER SPECIFICATION FOR BTG PACKAGE

S.No.	Features	Essential / Minumum Requirements
6	Current	: -5-60m Amp Resolution 1 micro amp.
7	Ohms	0-4000 Ohms
8	Frequency	120-50 KHZ
9	Power supply	240V, AC 50 Hz
10	Common Mode	80 db at 60 Hz or better rejection
11	Normal mode rejection	40 db at 60 Hz or better
12	Linearity	+ / - 0.005 percent of span
13	Repeatability	+ / - 0.005 percent of span
14	Ambient temp.effect	+ / - 0.005 percent/deg.C
15	Long term stability	+ / - 0.00025 percent/100 hr non-cumulative
16	Ambient temperature	50 deg.C
17	Input protection	Upto 140V DC
18	Input/output isolation	300V DC, 50 M Ohm

Calibrator shall be furnished with RTD simulation facility, external charged battery pack, test leads, set of fuses, instruction manual. In addition one set of spare battery pack as well as charger for spare battery pack shall be supplied with each instrument.



1X800 MW COAL BASED NORTH CHENNAI THERMAL
POWER PROJECT STAGE III



EPC TENDER SPECIFICATION FOR BTG PACKAGE

xxxvii) Digital Insulation Tester

SLNO:21

S.No.	Features	Essential / Minumum Requirements
1	Measurement	Upto 100 Mega Ohm at 500 V
2	Accuracy	0.5% of reading over the range

xxxviii) Sound Level Monitor

SLNO:22

S.No.	Features	Essential / Minumum Requirements
1	Sound level range	50-100 dB, 80 to 130 dB
2	Resolution	0.01 inches/sec.
3	Frequency Range	20 Hz 8 KHz
4	Vibration Meter Range	0.05 to 3.93 inches/sec. At 10 1000 Hz
5	Display	LCD Digital Type
6	Accessories	Rechargeable Batteries, Software, interfacing cables & Ports



EPC TENDER SPECIFICATION FOR BTG PACKAGE

SLNO:23

xli) Portable Analogue & Digital Vibration Meter

This instrument shall measure vibration of machinery in terms of displacement, velocity and acceleration. Power supply shall be by self contained replaceable batteries.

- a) Displacement Range :0 to 3000 microns peak to peak.
- b) Velocity range : 0 to 3000 mm/sec.
- c) Acceleration range : 0 to 100 g's.

The instrument shall be furnished complete with vibration pick-up, straight probe. Carrying case and one meter cord for connecting pick-up to meter. Vibration Meter shall be of digital and analogue type separately. One extra cable of 10 meter long connecting the sensor & Electronic unit to take vibration measurements of vertical pumps to be supplied.

Note: Analogue meter is used to find out any vibration due to electrical problem in the motor by measuring the transient vibration.

SLNO:24 xlii) Vibration/ Shock Pulse Analyser cum Data Collector cum Balancer

S.No.	Features	Essential / Minimum Requirements
1	Frequency Range	DC and 21 cpm (0.36 Hz) to 1,500,000 cpm (25K Hz)
2	Acceleration Input	21 to 1,500,000 cpm or 120 to 1,500,000 cpm
3	Velocity Input	21 to 1,500,000 cpm or 120 to 1,500,000 cpm
4	Displacement Input	21 to 1,500,000 cpm or 1500 to 1,500,000 cpm or 120 to 1,500,000 cpm
5	Voltage Input	30 V DC (Aux. 2 I/P) or 5 V DC (Aux. 1 I/P)
6	Power	6 volt, 2.4 A hr rechargeable battery Min. operating time - 6.5 hrs.
7	Environment	Operating temp. Range -18°C to 60°C
8	Relative Humidity	0-95% non condensing
9	Splash	Resistant, sealed case
10	Output	RS 232 C port with HART for communication to 115,200 baud.
11	Accessories	As required with complete software.
12	Application	Analyzing bearing condition, measuring machine vibration & checking of rotational speed.
13	Type of Measurement	Acceleration, Velocity, Displacement, Phase, FFT,



EPC TENDER SPECIFICATION FOR BTG PACKAGE

S.No.	Features	Essential / Minumum Requirements
		CPB, HFD spectrum, Temperature, Thurst, Axial position etc. with auto ranging in RMS, peak to peak, bearing fault analysis feature, balancing kit for in situ dynamic balancing and required software for 1 plane, 2 plane balancing, route generation and maintenance facility with off route data collection and analysis.
14	Averaging Type	Linear, Exponential, Peak Hold

xlili) Decade Resistance Box

SLNO:25 This should be three nos. analog type decade resistance box with resistance range of 1 ohm to 1.2M ohm, $\pm 1\%$ accuracy, all resistors rated to 0.75W, and shall use stable metal film resistors with complete electrostatic screening. This shall be supplied with certificate traceable to National /International Standards.

This shall be two nos. digital type decade resistance box with resistance range of 1 ohm to 1.2M ohm, $\pm 0.05\%$ accuracy.

One no. digital type variable Decade resistance Box, shall be provided as an accurate resistance source for calibration of RTD elements and receiver devices. The range shall be 0-100 ohm with increments of 0.001 ohm. Accuracy shall be $\pm 0.05\%$ or better.

xliv) Decade Capacitance Box

SLNO:26 The variable capacitance device shall provide an accurate capacitance source for different purposes.

The equipment shall meet the following requirement as a minimum.

- | | | | |
|----|--------------------------|---|---|
| a) | Range | : | 100 pF to 10 Micro F in steps of 100 pF |
| b) | Residual capacitance max | : | 20 Pf |
| c) | Accuracy | : | $\pm 1\%$ |
| d) | Operating voltage | : | upto 100V dc |

xliv) Decade Inductance Box

SLNO:27 The variable inductance device shall provide an accurate Inductance source for various purposes as a minimum. It shall meet the following requirement as a minimum.

- | | | | |
|----|---------------------|---|--------------|
| a) | Range | : | 1 mH to 10 H |
| b) | Accuracy | : | $\pm 2\%$ |
| c) | Residual Inductance | : | < 0.5 mH |
| d) | Operating Voltage | : | 240 V |



SLNO:28 xlvii) LAN/ Coaxial Cable Meter/ Tester

This portable unit is used to check the quality of cable and test and troubleshoot coaxial and twisted pair cable in Local Area Network (LAN) installations. It shall be powered by standard AA alkaline battery allowing minimum 8 hour of operation. The cable meter shall meet the following requirement as minimum.

S.No.	Features	Essential / Minumum Requirements
1	Display	Backlit LCD Display for observing result in sheet dark environment and emit audible tone to assist in pass/fail indication.
2	Test Standard	IEEE-802 & EIA/TIA 568
3	Range	For unshielded twisted pair (UTP) - 6 to 600 m For shielded twisted pair (STP) - 6 to 600 m For Coaxial cable - 6 to 1200 m
4	Accuracy	6 m to 60 m - ± 0.6 m (or) 60 m to 1200 mm - $\pm 1\%$
5	Resolution	1 m
6	Storage	allows storage of 400 complete test results for printing
7	Near end cross talk	0 to 50 db (Next TP only)



1X800 MW COAL BASED NORTH CHENNAI THERMAL
POWER PROJECT STAGE III



EPC TENDER SPECIFICATION FOR BTG PACKAGE

S.No.	Features	Essential / Minumum Requirements
8	Characteristics	TP Cable 75 W - 180 W impedance range Coaxial - 40 W - 120 W with accuracy of ± 10 W
9	Accessories	Carry case, printer cable, battery & instruction manual.
10	Q uantity	2

SLNO:29

xlix) Earth Resistance Tester

The unit should meet safety requirements as per IEC61010-1:1990 and feature:-

- 1) It shall be able to measure earth resistance of various earth installations and the resistance of low resistance conductor.
- 2) Suitable to test earth resistivity and earth voltage.
- 3) 1/2 LCD Digital Display
- 4) It shall be able to operate with the minimum influence from earth voltage.
- 5) Low power consumption and powered by batteries.



1X800 MW COAL BASED NORTH CHENNAI THERMAL
POWER PROJECT STAGE III



EPC TENDER SPECIFICATION FOR BTG PACKAGE

- 6) Low batteries indication.
- 7) If the testing current has no return loop or the resistance value of auxiliary resistance exceeds the upper limitation, a display indication shall be available
- 8) Dust-proof and damp-proof construction suited for outdoor use.
- 9) The unit shall be supplied complete with test leads (red, yellow, green, black - each 1.5m), Two bars, Test wires (20m & 40m), Instruction Manual, Carry-case, Screw driver and other accessories as required.

S.No.	Features	Essential / Minumum Requirements
10	Earth Resistance Test	
a	Measuring Ranges	
b	Accuracy	Base Error + (5% of reading + 2d) Error from earth
11	Earth Voltage Measurement	
a	Measuring Ranges	0.00 to 19.99V
b	Accuracy	+ / - (5% of reading +2d)
c	Insulation Resistance	
d	Withstand Voltage	AC 1.5kV 50Hz 1min
e	Power Supply	1.5V (R6 or AA) batteries/ rechargeable batteries.



1X800 MW COAL BASED NORTH CHENNAI THERMAL
POWER PROJECT STAGE III



EPC TENDER SPECIFICATION FOR BTG PACKAGE

SLNO:30

liv) Fiber Optic Testing Tool Set

- a) Source and Power Meter Optical Loss Test set (OLTS)
- b) Reference Test Cables
- c) Fiber Tracer and Visual Fault Locator
- d) Optical Time Domain Reflectometer (OTDR)
- e) Cleaning material like Lint free Cleaning wipes.
- f) Optical Fibre Cable Joining Kit.



EPC TENDER SPECIFICATION FOR BTG PACKAGE

SLNO:31 Ivi) Tong Tester

Electronic type tong tester shall be suitable for measuring the current range of 0-5/10-15/30 Amps AC and DC. Auto ranging and 3 ½ LCD facility shall be available. It shall have swivelling joint between tongs and meter to facilitate easy reading.

SLNO:32

Iviii) Stroboscope

S.No.	Features	Essential / Minumum Requirements
1	Power Supply	240 V AC 50 Hz supply
2	Display	4 and 1/2 digit LCD
3	Accuracy	+ / - 0.1% Digital LCD
4	Low range	100-1000 rpm.
5	High range	100-10000 rpm
6	Sampling line	1 sec or better
7	Flash tube	Xenon lamp with Flash color white 6500K. with automatic flash control
8	Accessories	Adopter, Rechargable Batteries, Charger, case etc.

SLNO:33 Iix) Auto Transformer

S.No.	Features	Essential / Minumum Requirements
1	Max. input voltage	250V, AC 50Hz, Single phase
2	Max. output voltage	0-112% , Single Phase



1X800 MW COAL BASED NORTH CHENNAI THERMAL
POWER PROJECT STAGE III



EPC TENDER SPECIFICATION FOR BTG PACKAGE

S.No.	Features	Essential / Minumum Requirements
3	Rated current	20 Amp., Single Phase
4	Max. input voltage	415V, AC
5	Max. output voltage	470 V AC, Three Phase
6	Rated current	10 Amp., Three Phase
7	Insulation resistance	Greater than 5 M ohm at 500 VDC
8	High voltage test	1.5 KV
9	Feature	Voltage scale around the voltage varying knob of auto transformer shall have white lettering and graduation as black back ground.

ix) Test Temperature Detector

SLNO:34

1) Test RTD

S.No.	Features	Essential / Minumum Requirements
1	Sensor type	Platinum resistance element, Three/Four wire type
2	Outer Sheath material	Ultra High Purity Quartz
3	Minimum Diameter	6 - 7.5 mm
4	Minimum Length	650 mm
5	Accuracy/Stability	0.03 °C
6	Temperature range	0-1000 °C
7	Accessories	Connecting cable, carrying case.

2) Test K Type Thermocouple (Industrial Grade)

S.No.	Features	Essential / Minumum Requirements
1	Sensor type	Type K NiCr-NiAl, Mineral insulate T/C with Pot seal
2	Sheath Material	Inconel 600
3	Sheath Dimensions	1.5 mm dia x 300 mm long
4	Temperature range	0-1100 °C
5	Accuracy/Uncertainty	1.1 °C
6	Calibration Certificate	To be provided from accredited LAB
7	Accessories	Connecting cable, extension wire, carrying case

3) Test T Type Thermocouple (Industrial Grade)

S.No.	Features	Essential / Minumum Requirements
1	Sensor type	Type T Cu-CuNi, Mineral insulate T/C with Pot seal
2	Sheath Material	321SS
3	Sheath Dimensions	3.0 mm dia x 500 mm long
4	Temperature range	0-500 °C



EPC TENDER SPECIFICATION FOR BTG PACKAGE

S.No.	Features	Essential / Minimum Requirements
5	Accuracy/Uncertainty	0.5 °C
6	Calibration Certificate	To be provided from accredited LAB
7	Accessories	Connecting cable, extension wire, carrying case
8	Type of End Seal	Long crimp on stainless steel pot seal epoxy resin backed
9	Swaged Tip	2.0mm (approx. 50mm long)

SLNO:35 lxi) Overhead Interactive White Projection board

Two Nos. of overhead projection board (Interactive White Board) with complete accessories, software i.e one for conference room at service building & one for training room shall be provided by bidder. These boards shall act as I/O device from/to the desktop computer or laptop computer. These Interactive white boards shall be provided with following minimum features

- better.
- Hand writing recognition with multi touch function
- Scroll down facility with wireless facility enabled.
- Remote conferencing enabled
- Should support OS: Windows, Mac and Linux
- Accessories as Stylus Pens & eraser including one spare set, VGA cable, wall mount brackets etc.
- Minimum 1 KVA industrial grade UPS with 60 minutes Ni Cd battery backup for each overhead projection board.

SLNO:36 lxii) Projector with white marker board.

for
conference room at Administrative building. The projector will have following minimum features:

DLP/LCD based technology, Minimum 3000 lumens, minimum contrast ratio 400:1, uniformity of minimum 90%, with wireless adapter, USB port, with in-built speaker, able to provide Full HD view, motorized zoom & focusing, Optional lenses in built for short & long throw, auto image feature depending upon input, with universal inputs like VGA, S video input, Composite video, IR, Audio, etc. and Network capability.

SLNO:37 lxiii) Portable pH Calibrator/Simulator

To Check & calibrate the pH analysers/measuring equipments, compact portable pH simulator/calibrator with LCD digital display shall be supplied by bidder.

S.No.	Features	Essential / Minimum Requirements
1	Range	0-14 pH in steps of 1 pH



1X800 MW COAL BASED NORTH CHENNAI THERMAL
POWER PROJECT STAGE III



EPC TENDER SPECIFICATION FOR BTG PACKAGE

S.No.	Features	Essential / Minumum Requirements
2	Accuracy/Resolution	+/- 0.01 pH
3	Temp. Coeff.	0.001 pH/Deg c
4	Power Source	Built in chargeable Nicd battery with battery Check switch and indicator.
5	Accessories	Connector leads, Carrying case etc



EPC TENDER SPECIFICATION FOR BTG PACKAGE

SLNO:38

lxv) Logic Probe

Logic probes shall be furnished to test the computer systems. It shall operate in pulse & normal mode. It must be capable of testing all digital logics such as CMOS, TTL; DTL etc. logic probes are envisaged to check the status of the binary logic modules. These shall be LED with current limiting resistor etc. with each of the logic probe. The LED shall glow whenever test

be protected from overload and shall have pulse stretching facility. Pulse repetition frequency up to 80M Hz for TTL and 40M Hz for CMOS circuits. Types of logic probe necessary shall be guided by the types of binary logic supplied by the Bidder.

SLNO:39

lxvi) Marker Printers:-

For Printing of silicon and halogen free labels of Polyamide, marker printers with high-speed UV hardening technology shall be provided by bidder. The printing method is based on a print head with a LED UV Unit for hardening the fluid. The Labels printed with UV technology can withstand temperature from - 40°C to 120 °C. The Printers shall be capable of printing various types of printing suitable for Cable marking, terminal marking and equipment marking. The printer should come with software that supports all types of printing used for marking. All software shall be loaded in separate operating station.

Marker Printers with High-speed UV hardening printer shall comply standards like DIN EN ISO 1043-4, DIN EN ISO 4892-2 AND DIN EN ISO 60068, DIN EN ISO 175, DIN 50018, DIN EN ISO 2409, IEC 60947-7-1/2, IEC 60068-2-11/52 and EN 60464-2:2001 etc.

Accessories:

- i) Terminal marker card for 5mm, 6mm, 8mm & 10 mm Pitch (250 No.Each)
- ii) Wire Marker Card for wire diameter 1.9mm, 2.1mm, 2.9mm 3.1mm 3.6mm, 4.4mm, 4.9mm, 5.6 mm 7.5mm and more than 7.5mm. (250 No. Each)
- iii) Equipment Marking Card with carrier (200 No.).
- iv) Ink Cartridge for Printing above material (25 Nos.)"

SLNO:40

lxvii) D.C. Regulated Power Supply

Bidder shall supply D.C. Regulated Power Supply designed with latest state of the art electronic and IC technology. D.C. Regulated power supply shall have the following features:

S.No.	Features	Essential / Minimum Requirements
1	Voltage Range	0 to +60V DC, 5 Amps. (Floating) (Continuously adjustable)



1X800 MW COAL BASED NORTH CHENNAI THERMAL
POWER PROJECT STAGE III



EPC TENDER SPECIFICATION FOR BTG PACKAGE

S.No.	Features	Essential / Minumum Requirements
2	Voltage/Current Range meters	0-60V/0-10 A
3	Display	LCD
4	Meter Accuracy	+/- 2% FSD
5	Power Supply Connection	240V AC, 50 Hz.
6	Output Impedance	50 Ohm or less.
7	Load Regulation	0.1% variation in voltage & 0.2% variation in current
8	Drift in 8 Hours	0.1% variation in voltage & 0.2% variation in current
9	Ripple and Noise	Less than 1mV
10	Setting Resolution	20mV / 20mA
11	Temperature Coefficient	0.05% per Deg.c
12	Accessories	Test cords and clips are required.
13	Q uantities	4 nos.
14	Power supply shall be short circuit proof and crowbar protected.	



SLNO:41

Ixxii) Frequency Counter:

S.No.	Features	Essential / Minumum Requirements
1	Type	Universal, Dual Channel
2	Display	8 digits with Hz, kHz, MHz
3	Range	0.01 Hz to 120 M Hz & 50 M Hz to 2.7 GHz
4	Sensitivity	10mV RMS typical & 50 m V RMS
5	Time base Stability	+ / - 1 PPM
6	Features	i) Trigger Function ii) Frequency ratio measurement function iii) Time Interval measurement function iv) External frequency standard input

SLNO:42 Ixxiii) Portable Conductivity Meter

To Check & calibrate the conductivity analysers/measuring equipments, compact portable conductivity simulator/calibrator with LCD digital display shall be supplied by bidder.



EPC TENDER SPECIFICATION FOR BTG PACKAGE

S.No.	Features	Essential / Minumum Requirements
1	Range	0.001 micro Siemens/cm to 1000 mS/cm
2	Accuracy	+/- 0.01 micro Siemens/cm of reading
3	Resolution	+/- 0.01 micro Siemens/cm
4	Temp. Coeff.	0.00 to 10.00 % /Deg c
5	Power Source	Built in chargeable Nicd battery with battery Check switch and indicator.
6	Lab OWS connectivity	Yes
7	Range Mode	Auto mode, Fixed mode. .
8	Accessories	Connector leads, Carrying case etc.

SLNO:43 lxxiv) Vibration Pick-Up Tester

Instrument shall be suitable for testing of both non contact and seismic probes supplied by the machine monitoring instrument supplier. Shaker table to simulate the required vibration levels so as to check and validate the vibration pickups is to be supplied.

SLNO:44 lxxv) Stabilised Pow er Supply

Bidder shall supply stabilized power supply designed with latest electronics and IC technology. It shall have the following minimum features.

S.No.	Features	Essential / Minumum Requirements
1	Voltage Range	0-240V AC, continuously adjustable.
2	Power supply consumption	240V AC, 50 Hz
3	Indication	Meters indicating voltage and current shall be integral with power supply
4	Load Regulation	0.25% variation in voltage

SLNO:45 lxxvi) Continuity Tester

Continuity tester shall be electronic and battery operated. A hooter shall be provided which will sound when continuity detected. Tester shall be supplied with battery charger, lead wires and probes. The tester shall be kept in a carrying case.

lxxvii) Optical time Domain reflectometer

- SLNO:46 1) A recording optical time domain reflecto meter (OTDR) will be utilized to test for end-to-end continuity and attenuation of each optical fiber. The OTDR shall be equipped with data storage (1 GB internal flash memory min.), printer, help feature, compare trace features and OTDR software. The data storage unit must include a built-in memory drive capable of storing a minimum of 100 test traces. Display shall be colored 6 inch TFT minimum. OTDR shall have built in power meter & visual fault locator.



EPC TENDER SPECIFICATION FOR BTG PACKAGE

- i) Safety Class: -Class I FDA 21 CFR 1040.10 & 1040.11, IEC 60825-1:2007-03
- ii) Test Mode: - OTDR (Full auto, Expert Real Time), Auto test, OPM, OLS, VFL, DFS (Digital Fiber scope).

Application:-

- a) Automatic Pass/Fail Analysis (TIA/ISO/EN)
 - b) Bi directionally measure loss and length of fiber links.
 - c) Tier 1 & Tier 2 testing of networks.
- 2) Data traces saved to disk shall include the following labels.
- a) Fiber Identification (ID) with a minimum of 10 characters.
 - b) Cable ID with a minimum of 10 characters
 - c) OTDR location with a minimum of 20 characters
 - d) Far End location with a minimum of 20 characters.
 - e) Test operator initials with a minimum of 3 characters.
- 3) The printer shall preferable be internal. The printer shall be able to print data traces within 30 seconds or less. The machine setting used to repeat tests at a later time shall include index, range, wavelength, average time, pulse width and scale settings. The test results (on printout) shall provide information including: loss, distance, reflectance, data and time.
- 4) The requirements for the compare trace feature include the ability to recall two historical traces from a diskette and display them simultaneously for analysis and printing. The compare trace must compute and display a single graph representing any differences between two traces. The compare trace must be able to recall historical traces from a discrete and perform the same tests on connected live fibers. The compare trace shall perform a two point loss measurement test for any two particular fibers in a comparison analysis. The losses between the two points on the each fiber shall be displayed, and the differences between the two readings clearly shown.
- 5) The OTDR must be equipped with software to support all of the required functions. The software shall provide for printing of whole set of traces (batch print) with minimal commands eliminating the time spent for printing traces individually.
- 6) Bidder shall provide all mounting accessories, cables and connectors required to establish data communication.
- 7) Power supply Rechargeable batteries for 7 hours operation as per Telcordia (Bell core). Universal type AC/DC Adaptor.
- 8) Interfacing - USB ports, RJ45 LAN ports, Fiber inspection probe connector port, built in Bluetooth & Wi-Fi.
- 9) Accessories Fiber inspection probe, carrying case, USB mouse, USB keyboard, gloves, cable kits, softwares.



1X800 MW COAL BASED NORTH CHENNAI THERMAL
POWER PROJECT STAGE III



EPC TENDER SPECIFICATION FOR BTG PACKAGE

47. LAB WORKSTATION , A3/A4 B/W DIGITAL LASER PRINTER CUM COPIER AND LAPTOP

All the calibration instruments shall have a common WORK STATIONS along with A3/A4 sized B/W Digital Laser jet printer cum Copier for calibration and report generation. One no. lab laptop shall also be provided by bidder. Specification for WORK STATIONS, Laptop and Printer shall be same as specified elsewhere in the specification.

(REFER SPECS GIVEN)

2.3.4.26 Specifications for Operator Station, Engineering Work Stations

Each operating station & Engineering work stations and any other work stations / PC envisaged in plant shall meet following minimum requirements & as per latest trends at the time of supply:

1. On board Intel Xeon quad core, 3.46 GHz processor with 1066 MHz bus with Hyper threading or higher.
2. 4GB DDR3 RAM (min.)
3. 1 x 1000 GB IDE Hard Disc Drive of 7200 RPM or higher
4. 1024 MB Graphic Accelerator
5. System chipset: Intel Express
6. 2 x RS 232 ports
7. 1 x parallel port
8. 4 nos. USB ports. (2 nos. on front side)
9. 1 x 52 X DVD / CD Read Drive
10. 16 X DVD R / W Drive
11. 2 x Ethernet (10 / 100 / 1000MB) cards (Industrial Grade)
12. UXGA graphics and monitor 1920 X 1248, 256 colours with MRPII compliant, viewing Angle 178° vertical & Horizontal and fastest response time.
13. 1 x windows XP/7 Professional or latest & proven version of Windows OS Professional with Multimedia
14. Ethernet adapter
15. Third party operating system, graphical users interface and software, if required.
16. 2 nos. graphic output cards minimum
17. Optical mouse
18. Sound card
19. Internal speakers
20. Wireless internet & Blue tooth Interface
21. Redundant power supply (In built)
22. General MS Windows latest, MS-Office Professional, Adobe Acrobat, anti-virus McAfee or equivalent, AutoCAD etc.
23. Application engineering & HMI software to suit project Specific requirement
24. All OWS shall be interchangeable

2.3.4.27 Peripherals for Operator Station, Engineering Work Stations & Server System

- a) Full flat monitors with LED back lighting

The bidder shall furnish OWS / EWS / Servers / PC with coloured full flat monitors with LED back lighting. OWS / EWS / Servers / PC with Monitors shall have a fast cursor control device like a track ball / optical mouse. All Monitors shall be of high resolution colour graphics type



EPC TENDER SPECIFICATION FOR BTG PACKAGE

and with not less than 32 colours. The picture frequency shall not exceed 85 Hz. The resolution required is 1920 X 1248 pixel or better. The picture shall be stable and completely free of any flickering. The screen illumination shall be enough to give good readability. The

better size monitors shall be supplied by the bidder. Monitors shall be equipped with all adjusting elements accessible on the front plate. Monitors with 3D capabilities for graphics shall be provided by bidder.

Monitors along with keyboard & optical mouse shall be mounted on supervisory control console specified elsewhere in the specification.

b) Key Board

Functional key boards for plant operator station shall be of special type adopted to operation tasks and monitor functions. It shall contain all keys necessary for plant operation arranged in an ergonomically manner. Multifunction keys shall be provided with automatic display for modified functions. Freely programmable keys (Minimum 101) shall be available for special user application.

Key Board shall be integrated into supervisors control consoles horizontal part.

Provision of functional keyboard shall be in addition to facility for operator control through mouse / track ball.

Membrane type keyboard shall be provided for operator interface with process for plant control and display functions to access plant data in conjunction with control OPERATING STATIONS. Membrane keypad shall be assignable with LED alarms, dedicated display selection keys with spare provision, hardware locking facility to set OPERATING STATION in engineer, supervisor or operator mode. The keyboard shall have a minimum of 101 configurable keys for assigning most frequently used displays. A minimum of forty of those keys shall have two independently lit LED's used for event-specific alarm annunciation.

Keyboard shall be provided to enable the shift supervisor to develop graphic displays, control system software and system configuration for the DDCMIS. It shall be possible to perform operating interface functions from engineering OPERATING STATION. Assignable function keys shall be provided for execution of command, program etc. Hardware facility shall be provided to set OPERATING STATION in engineer or operator mode. QWERTY type keyboard shall be alternatively for

OWS.

c) ~~Printers - Line Impact Heavy Duty Dot Matrix Printers~~

~~All printers shall be low noise (less than 60dB) type with a minimum of 136 columns. Printing speed shall be a minimum of 300 characters per second. Since the control room printers are~~



EPC TENDER SPECIFICATION FOR BTG PACKAGE

high-speed printers, the system shall output to these printers at the rate of 1000 lines of printout per minute as a minimum. This rate shall be independent of the number of printers in simultaneous operation. Style of printing available shall be indicated by the Bidder. The printers shall have graphic capability and any OPERATING STATION display may be printed on the printer. The printing shall be bi-directional and in two colours black and red for sequence of event recording. Paper input capacity shall be with continuous paper feed.

Printers shall accept and print all ASCII characters via an E.I.A.RS-232C or twenty milliamp current loop interface. Parity checking shall be utilized. All printers mounted shall be provided with a separate printer enclosure each. The enclosures shall be designed to permit full enclosure of the printers at a convenient level. Plexiglas windows shall be used to provide visual inspection of the printers and ease of reading. Printer enclosures shall be designed to protect the printers from accidental external contact and each should be removable from hinges at the back and shall be provided with a lock at the front. If one of the printers fails to operate, its functions shall automatically be transferred to the other printer. Failure of the printer shall be indicated on all operating stations. Printer shall be offered and supplied from reputed manufacturer with latest proven technology. 5 Rims of papers of highest size (A3/A4 of the respective printer) shall be provided by bidder for each printer provided with subject plant.

Coloured Laser Jet printer		
S.No	Features	Essential / Minimum requirements
1	Printing speed	20 ppm (min.)
2	Resolution	1200 X 600 dpi
3	Memory	128 MB (min.)
4	External Port	1 no. USB 2.0 port, and TCP / IP 10 / 100, Ethernet, Blue tooth interface
5	Duty Cycle	40,000 pages per month
6	Pages size	A3, A4, and Transparency etc. with automatic duplex printing facility

Laser Jet printer (B & W)		
S.No	Features	Essential / Minimum requirements
1	Printing speed	30 ppm (min.)
2	Resolution	1200 X 1200 dpi
3	Memory	128 MB (min.)
4	External Port	1 no. USB 2.0 port, and TCP / IP 10 / 100, Ethernet, Blue tooth interface
5	Duty Cycle	15,000 pages per month
6	Pages size	A3, A4, and Transparency etc. with automatic duplex printing facility, Paper Tray 2 nos

Ink Jet Printers (Coloured)		
S.No	Features	Essential / Minimum requirements
1	Printing speed	30 ppm (min.)



1X800 MW COAL BASED NORTH CHENNAI THERMAL
POWER PROJECT STAGE III



EPC TENDER SPECIFICATION FOR BTG PACKAGE

2	Resolution	1200 X 1200 dpi
3	Memory	64 MB (min.)
4	External Port	1 no. USB 2.0 port, and TCP / IP 10 / 100, Ethernet, Blue tooth interface
5	Duty Cycle	5,000 pages per month
6	Pages size	A4, Transparency etc.
7	Duplex Printing	Automatic

Scanner, Copier cum Printer (A3 size) - Ink Jet Printers (Coloured)		
S.No	Features	Essential / Minimum requirements
1	Resolution	1200 x600 dpi (optical) (min) for Printer & 600 x600 dpi (optical) (min) for Scanner
2	Colour Depth	48 bit
3	Scaling	10 to 2000% in 1% increments
4	USB interface	Required
5	Memory	1 GB
6	Printing Speed	30 ppm (min.) for A4 size & 20 ppm (min) for A3 size
7	Duplex printing	Automatic

Five sets of print cartridges and five rims of papers shall be provided with each printer provided anywhere in the plant by bidder with each DDCMIS, DCS & PLC system and any other system specified elsewhere in specification.

Preferred makes of printers are HP, Canon, Fuji Xerox, & Epson.

d) External DVD/CD Drive

The external DVD/CD drive is a back-up device. The external DVD/CD drive shall have read/write capability and shall be provided with all required hardware interface including error detection and correction facilities.

Features

1. Supported Formats: DVD+R, DVD+RW, DVD-R, DVD-RW, DVD-ROM, DVD-video, CD-R/RW, CD-ROM/XA, CD-ROM, Audio CD, VCD, CD-I(FMV), Photo CD, CD-EXTRA, CD-TEXT
2. Write Speed: 8x DVD+R, 4x DVD+RW, 24x CD-R, 16x CD-RW
3. Read Speed: 24x CD-ROM, 8x DVD-ROM
4. Compliant with USB 2.0 High-Speed (480Mbps)
5. Bootable on OWSs/Laptops
6. Memory buffer size: 2MB minimum.
7. Powered by an additional USB power cable for best speed. (Requires one more USB port available)
8. Can be powerless (only connected by the USB data cable).



EPC TENDER SPECIFICATION FOR BTG PACKAGE

9. Plug & Play and hot pluggable.
10. Portable Design.

Five nos. Boxes of DVD (Re-writeable) shall be provided with each external DVD/CD drive provided.

e) External DAT Drive

The DAT drive is a serial back-up device. The DAT drive shall have read / write capability and shall be provided with all required hardware interface including error detection and correction facilities in each control room. The tape (total 10 nos.) of Sony make shall have the capacity of 12 / 24 GB min. The tape drive shall be specified as follows:-

- DC drive
- Tape format - QIC-80
- Data Transfer Rate 5MB / minute.
- Seek time 22 milli second

f) Hard Copy Facilities

The system shall be capable of copying hard copy of OPERATING STATION graphics through a video colour copier switch able to any OPERATING STATION.

The printer / copier offered shall be capable of copying OPERATING STATION image in 20 seconds.

g) USB Port Pen Drive

Twenty Five (25) no. USB Port pen drive having 32GB / 64GB memory with read / write facility shall be provided. Preferred makes of USB pen Drive are HP, SanDisk, Kingston, and Strontium.

h) Scanner, Copier cum Printer (A3 size)

S.No	Features	Essential / Minimum requirements
1	Resolution	1200 x600 dpi (optical) (min) for Printer, 600 x600 dpi (optical) (min) for Scanner
2	Colour Depth	48 bit
3	Scaling	10 to 2000% in 1% increments
4	USB interface	required.
5	Memory	1 GB
6	Printing Speed	30 ppm (min.) for A4 size, 20 ppm (min) for A3 size
7	Duplex printing	Automatic



EPC TENDER SPECIFICATION FOR BTG PACKAGE

i) DVD Writer

The DVD writer should be capable to read and write any DVDs as well as CDs. and shall be provided with all required hardware interface including error detection and correction. The DVD writer shall meet following minimum requirements:

DVD write speed - 16x
CD write speed - 52x
Cache / Buffer size - 2MB
Buffer under protection technology

Five nos of DVD (Re-writeable) shall be provided with each OWS / server provided anywhere in the plant by bidder with each DDCMIS, DCS & PLC system and any other system specified elsewhere in specification.

j) Digital B/W Copier cum Printer (A3 size)

Digital B/W Copier cum Printer (A3 size)		
S.No	Features	Essential / Minimum requirements
1	Type	Laser, table top / latest
2	Printer memory	512 MB (Min.)
3	Speed	Monochrome 30 ppm - A4, 20 ppm A3
4	Resolution	600 x 600 DPI
5	No. of color (Basic)	Monochrome
6	Duty cycle	Monochrome more than 75000 pages / month
7	Power supply	240 V, 50 Hz, 1 phase UPS
8	Ambient temperature	0-50° C
9	Humidity	95% non-condensing
10	Size of paper	Paper weight of 45 to 165 g/M2
11	Networking Capability	USB / Ethernet
12	Coping	Max Original Size A3, Continuous Coping (1-999)
13	Accessories	1. Adapters 2. Connector Cable 3. Duplex Unit. Automatic 4. iv) Optional Paper feeder- 2 Nos

k) Lap Top

operator station functionalities of the Engineering/programming stations mentioned in the



EPC TENDER SPECIFICATION FOR BTG PACKAGE

specifications shall be provided (including requisite license).

- a) Intel Centrino™ Mobile Technology.
- b) Intel Core vpro latest generation Processor with 3.46 GHz, 4 MB L2 cache, 1066MHz FSB.
- c) e angle viewing.
- d) 1000 GB 7200 rpm HDD with shock absorber.
- e) 8 GB 800 MHz DDR3 SDRAM (slot for 1no. additional RAM slot should be provided)
- f) 1 x windows XP/7/8/10 Professional or latest & proven version of Windows OS with Multimedia
- g) Slim type DVD-RW/DVD ROM combo drive.
- h) Internal 10/100/1000Mbps Ethernet card
- i) IEEE 802.11B connectivity port
- j) IR port - Optical mouse
- k) 2Nos. USB 3.0/2.0 or latest version ports & Wireless INTERNET & blue tooth Interface.
- l) External mouse connectivity and optical mouse
- m) Minimum 8 hrs battery backup.
- n) Recovery software tools.
- o) Sound cards
- p) Internal speakers -General MS Windows latest, MS-Office Professional, Microsoft Visual Studio, Adobe Acrobat, anti-virus McAfee or equivalent, etc.
- q) Application engineering & HMI software - to suit project specific requirement.
- r) Carry Bag, Power Adapter.
- s) 1024 MB Graphic Accelerator

Preferred makes of Laptop are DELL, HPCOMPAQ, VAIO (Sony), Lenovo.

I) General Specification of the server:

S.No	Features	Essential / Minimum requirements
1	Enclosure	6U Rack Mountable server / Tower type Sever
2	Processor	Intel Xeon Quad (4) Core 64 bit, Processor capable 3.6 GHz with 16MB L3 cache memory per processor, Dual independent 1333 MHz system bus (2 way SMF) or better
3	Memory	64GB ECC DDR 3, 800 SDRAM
4	Video	Integrated with 64MB SDRAM
5	Resolution	1920 x 1248
6	Drives	i. HDD RAID 5 (1000 GB) ii. Ultra 320 SCSI adaptors with internal storage capacity 3.6 TB iii. DVD/CDROM 24X CD RW/DVD IDE combo iv. USB 4 ports v. DAT 36 / 72 GB
7	Peripherals	PS/2 keyboard & Optical Mouse
8	Operating system	Windows 2008 server version standard / latest Enterprise Edition or latest & proven version of Windows Operating system



1X800 MW COAL BASED NORTH CHENNAI THERMAL
POWER PROJECT STAGE III



EPC TENDER SPECIFICATION FOR BTG PACKAGE

lxxviii) Bill of Material

customer approved makes

S.No	LAB Instrument	Make	Quantity (Nos)
1.	Electronic Test Bench	Tinsley / Scandura - Itlay / BEAMEX / Isothermal Technology Pvt Ltd (ITPL).	1
2.	Computer aided Calibration system with one no. OW S, Printer and Complete Software	Scandura, Itlay / BEAMEX / ITPL / Time Electronics (Note- Make of OW S & printer shall be same as specified elsewhere in the specification).	1 set
3.	Portable Calibrator for Vacuum	Tinsley / BEAMEX / Scandura / Eurotron / Druck / Time Electronics / ITPL	1
3.	Portable Digital Multimeter (4 ½ digit)	Tektronix / Extech / Tinsley / Eurotron / Yokogawa / Scandura / Fluke / Agilent / Time Electronics / ITPL	15
4.	Digital Multimeter (Table Mounting Type)	Tinsley / Scandura / BEAMEX / HP(Agilent) / Tektronix / Time Electronics / ITPL	4 (2 each for 5 ½ & 7 ½ digit)
6.1	U-Tube Manometer	Dwyer / Meriam / Tinsley / Fitzer / Yokogawa / ITPL	2 no. of each type.
6.2	Inclined Tube Manometer	Dwyer / Meriam / Tinsley / Fitzer / Yokogawa / ITPL	2 no. of each type.
7.	Test Manometer	Dwyer / Meriam / Tinsley / Fitzer / Yokogawa / ITPL	2
8.	Digital Manometer	Meriam / Tinsley / Fitzer / Yokogawa / Cole Parmer / Beamex / Time Electronics / ITPL / AOIP	2
9.	a. Dead Weight Tester b. Vacuum Tester	Tinsley / Scandura / BEAMEX / Budenberg / Time Electronics / ITPL	1 no. each
10.	Standard Pressure Gauges	Ametek / Budenberg / Tinsley / Scandura / Time Electronics / ITPL	2 no. each type with Hydraulic pressure-gauge tester.
11	i. Microprocessor based Fluidized Temperature Bath ii. Low, Medium & High temp Portable Dry block type Calibrator	Scandura / Tinsley / BEAMEX / Jofra / Isotech	2 nos. for Microprocessor based Fluidized Temperature Bath & For dry block type calibrator, 1 no. of each type & range.
5	RCL Meter	Fluke / Philips / Scandura / Tinsley / Agilent / WayneKerr / ITPL	1
6	In Circuit Tester	HP / Teradyne / Aicosec / Alfa / Agilent / Philips / ITPL / Q Max / Estec.	1
7	Function Generator	Tektronix / HP / Tinsley / Yokogawa / Scandura / BEAMEX / ITPL	1



1X800 MW COAL BASED NORTH CHENNAI THERMAL
POWER PROJECT STAGE III



EPC TENDER SPECIFICATION FOR BTG PACKAGE

S.No	LAB Instrument	Make	Quantity (Nos)
8	Digital Oscilloscope	Tektronix / HP / Tinsley / Yokogawa / Scandura / BEAMEX / ITPL	1
9	Tachometer	Biddle / Ametek / Extech / Tinsley / B&K / ITPL	2
10	Soldering iron 10 Watts 25 Watts 40 Watts	Soldron / Heko / Xytronicx	3 (1 no. of each type)
11	Solder Sucker	Soldron / Heko / Xytronicx	2
12	Soldering Desoldering station	Soldron / Heko / Xytronicx	2
13	Potentiometer / Rheostat	Tinsley / Scandura / BEAMEX / ITPL	2A: 2 Nos. (5000
14	AC Thermometry Bridge	Tinsley (ASL) / Scandura / BEAMEX / Isotech / MI Canada	1no.
22	Mercury Thermometers	Tinsley / Scandura / Brooklyn / Amarrell / ITPL	2 no. for each range.
23	Flow meter Calibrator 0 1000 mmwcl 0 6000 mmwcl 0 30000 mmwcl	Tinsley / Odin / Ametek / E&H / Fuji / ITPL	3 (1 no. each)
15	Stop Watch	EHI Eric Armin / Gralab / Casio	2
25	Digital Thermograph / Hygrometer	Extech / Rosemount / Brooklyn / Tinsley / ITPL	1
26	Portable Flue gas Analyser	Endee / Land / Bacharach / H&B / Eurotron	1
27	Aneroid Barometer	Wallace / Tiernan / Brooklyn Novalynix / Transcat	1
28	Miscellaneous Items		
a	Tool-maker clamp jaw	ITPL / Beamex / Scandura / Taparia / RS components / Hitachi / Black & Decker	50 mm wide 1 100 mm wide 1
b	Hand operated wire wrap tool	ITPL / Beamex / Scandura / Taparia / RS components / Hitachi / Black & Decker	1
c	Trimmer & Alignment Tool Kit	ITPL / Beamex / Scandura / Taparia / RS components / Hitachi / Black & Decker	1
d	Magnetic screw driver	ITPL / Beamex / Scandura / Taparia / RS components / Hitachi / Black & Decker	3
e	SS & copper tube cutter / blender	ITPL / Beamex / Scandura / Taparia / RS components / Hitachi / Black & Decker	4
f	Standard tool box	ITPL / Beamex / Scandura / RS components / Hitachi / Black & Decker, phoenix	9
g	Coil winding machine	ITPL / Beamex / Scandura / Taparia / RS	1



1X800 MW COAL BASED NORTH CHENNAI THERMAL
POWER PROJECT STAGE III



EPC TENDER SPECIFICATION FOR BTG PACKAGE

S.No	LAB Instrument	Make	Quantity (Nos)
	single phase motor driven to wind wires of	components / BMP equipments / Hitachi / Black & Decker	
h	Electrically operated wire wrap (0.2 mm to 1 mm)	ITPL / Beamex / Scandura / Tapania / RS components / Hitachi / Black & Decker	2
i	Panel wiring tool kit	W ago, Phoenix, W eidmuller, ITPL	5
16	mV Calibrator	Scandura / Tinsley / Eurotron / Yokogawa / BEAMEX / Time Electronics / ITPL	3no. (Portable) 1 no.(Table mounted)
17	mA Calibrator	Scandura / Tinsley / Eurotron / Yokogawa / BEAMEX / Time Electronics / ITPL	6no. (Portable) 2 no.(Table mounted)
18	Thermocouple Calibrator	Scandura / Tinsley / Eurotron / Yokogawa / BEAMEX / Time Electronics / ITPL / AOIP	2no. (Portable) 2no.(Table mounted)
19	RTD Calibrator	Scandura / Tinsley / Eurotron / Yokogawa / BEAMEX / Time Electronics / ITPL / AOIP	1no. (Portable) 1no.(Table mounted)
	Pressure & Diff. Pressure Calibrator	Scandura / Tinsley / Eurotron / Yokogawa / BEAMEX / Time Electronics / ITPL	3 no. (Portable) 3 no.(Table mounted) for each range & Type
34	Vacuum Calibrator	Scandura / Tinsley / Eurotron / Yokogawa / BEAMEX / Time Electronics / ITPL	2no.(Table mounted)
20	Multi Function Calibrator	Scandura / Tinsley / Eurotron / Yokogawa / BEAMEX / Time Electronics / ITPL / AOIP	2
	Pressure & Vacuum Air Pump	Scandura / Tinsley / Eurotron / Yokogawa / BEAMEX / Time Electronics / ITPL / AOIP	1
21	Digital Insulation Tester	Scandura / Tinsley / Eurotron / Kyaritsu / B&K / ITPL / Schuetz.	2
22	Sound Level Monitor	CIRRUS (UK) / Tinsley / Baseline / B&K / ITPL	2
39	Air Set	Shavo-Norgen / Placka / SMC Pneumatic	2
40	Portable Electro-Pneumatic Calibrator i) 0 - 2 bar ii) 0 - 10 bar iii) 0 - 40 bar iv) 0 - 200 bar	Tinsley / SMC Pneumatic / H&B (ABB) / MTL / P&F / Time Electronics / ITPL / AOIP.	4(1 no. each type)
23	Portable Digital / Analogue Vibration Meter	IRD(Rockwell) / Vibrometer / Shinkawa / Bently / B&K / Provibtech	Digital type 3 Analogue type -2
24	vibration/shockpulse analyser cum Data Collector cum Balancer	IRD(Rockwell) / Vibrometer / Shinkawa / Bently / Provibtech / IMV	1



1X800 MW COAL BASED NORTH CHENNAI THERMAL
POWER PROJECT STAGE III



EPC TENDER SPECIFICATION FOR BTG PACKAGE

S.No	LAB Instrument	Make	Quantity (Nos)
25	Decade Resistance Box	Time Electronics / ITPL / Cropico / Eurotron / Yokogawa / Siemens / ABB / Emerson	3 no. Analog type 3 nos. Digital type
26	LAN / Coaxial Cable Meter / Tester	ITPL / Scandura / Beamex / RS components	2
	Portable Ultrasonic Flow meter	Fuji / E&H / ITPL / Dynasonic / Micronics	2
27	EARTH / Ground Resistance Tester	ITPL / Cropico / Scandura / Beamex	2 nose
	Portable Infrared Radiation Thermometers	ITPL / Extech / RAYTEK(Fluke) / MIKRON / COLE PARMER / Impac	1 no. of each type
	Thermocouple Test Furnace	Isotech / Scandura / Beamex / Jofra	1 no. each type
	Microprocessor based Portable H2 Gas Analyser	Hach Ultra / Ametek / Codel / e one / Eurotron	1
28	Fiber Optic Testing Tool Set	ITPL / Scandura / Beamex / RS components	2
	Industrial portable Vacuum Cleaner	LG, Electrolux, Godrej, Morphy Richards, Panasonic.	6
29	Tong Tester	Scandura / ITPL / Eurotron / Kyaritsu / W eschler	2
	Averaging Pitot Tube	Dietrich (Fisher Rosemount), Microprecision, Technomatic	2
30	Stroboscope	Biddle / Ametek / Extech / ITPL / B&K / Rishikesh / GenRed.	1 no.
31	Auto Transformer	AE / Meco / ITPL / Beamex / Scandura	Single Phase 2No Three Phase 2 No
32	Test Temp Dedector Test RTD, Test K Type Thermocouple & Test T Type Thermocouple	Isotech / Scandura / Beamex / Jofra	2 No of each type
33	Overhead projection Board (Interactive White Board)	Hitachi, Smarttech, Polyvision.	2 nos.
34	Projector with white board.	CASIO, SONY, BenQ, Panasonic, DELL	1 no.
35	Portable pH Calibrator / Simulator	Hanna Instruments / ABB / Hofmann / Eutech Instruments / Orion.	1 no.
	Oil Condition Monitor	Eaton / Precision Filtration	1 no.
36	Logic Probe	HP / Aicoset / Alfa / Tektronix / Elenco	1 no.
37	Marker Printers	Inkcups, Laselec SA, Phoenix, Taymer.	1 nos. of each type
38	DC Regulated Power Supply	Siemens, Cosel, Phoenix, Weidmuller	4 nos.
	Video Conferencing System	Polycom, Cisco, Sony, Panasonic, RADVISION.	1 Set



1X800 MW COAL BASED NORTH CHENNAI THERMAL
POWER PROJECT STAGE III



EPC TENDER SPECIFICATION FOR BTG PACKAGE

S.No	LAB Instrument	Make	Quantity (Nos)
65.	Visiter Identity card & Gate Pass Issuing System	Elitser, Dwon, 3M, EastNets, Hidglobal	1 Set
66.	Digital Camera	Sony, Panasonic, Canon, Nikon	2 nos.
67.	Digital video camera with in built projector	Sony, Panasonic, Canon, Nikon	1 no.

69.	Portable Infrared Radiation Thermograph (IR Imaging device & Camera)	ITPL / Extech / RAYTEK(Fluke) / MIKRON / COLE PARMER / Impac / Nippon.	1 no.
70	Grinding W heel	As approved by Owner.	1 no. of each type.
39	Frequency Counter	ITPL / W AYNEKERR / Goodwill / Beamex / Scandura / Taparia / RS components / BMP equipments / B&K	1 no.
40	Portable Conductivity Meter	Hanna Instruments / ABB / Hofmann / Eutech Instruments / Orion / Coleparmer.	1 no.
41	Vibration Pick Up tester	IRD(Rockwell) / Vibrometer / Shinkawa / Bentley / B&K / Provibtech / IMV / Fluke.	1 no.
42	240 VAC Single phase stabilized supply unit	Aplab, KEPCO, Aiger.	3 nos.
43	Continuity Tester	Scandura / ITPL / Eurotron / Kyaritsu / W eschler	9 nos.
44	Optical time Domain reflectometer	Fluke Network, Exfo, JSU, AFL, Anritsu, Yokogawa.	2 nos.
45	Decade Capacitance Box	Time Electronics / TPL/Cropico/Eurotron Yokogawa/Siemens/ABB/Emerson	1 no.
46	Decade Inductance Box	Time Electronics / TPL/Cropico/Eurotron Yokogawa/Siemens/ABB/Emerson	1 no.
	Laser based Shaft Alignment System	SKF, Hamar Laser, Easy Laser, Pruftechnik.	1 no.

47. LAB WORKSTATION , A3/A4 B/W DIGITAL LASER PRINER CUM COPIER AND LAPTOP -1 NO Each

ADDITIONAL PROPOSED MAKES UNDER APPROVAL

S/no	Item s/no& Desc	Makes
1	#12 .Soldering Desoldering station	Weller
2	#13. Potentiometer / Rheostat	Toshniwal
3	#14. AC thermometry Bridge	Acip france
4	#15 . Stop watch	Extech
5	#21. Digital Insulation Tester	Yokogawa
6	#23. Portable Digital /Analogue Vibration Meter	IRD Mechanalysis/ SKF
7	#24. vibration/shockpulse analyser cum Data Collector cum Balancer	SKF/ Bruel & Kjar (B&K Germany)
8	#25 Decade Resistance Box	Toshniwal
9	#26 .LAN / Coaxial Cable Meter / Tester	Ideal
10	#27.Earth /Ground Resistance Tester	Fluke/Fluke amprobe
11	#28 .Fiber Optic Testing Tool Set	Fluke/Sumitomo
12	#29.Tong tester	Yokogawa/Agilent/keysight
13	#32 Test Temp Detector	Fluke/ Tempsens
14	#36 Logic Probe	B&K Precison
15	#38.DC Regulated Power Supply	Aplab/Tektronix/ Agilent/Keysight, Keithly /B&K Precision
16	#42 Frequency Counter	Tektronix/Agilent/Keysight
17	#45 Continuity tester	Fluke/Fluke amprobe

Note : The above makes has been proposed for approval for this Project (North Chennai) , as they are already under approved makes in ENNORE LAB (Elec) project . Hence vendors can offer these makes subject to the approval of customer.

If any other make is approved, the same will be intimated to participating vendors during technical evaluation.